MINING WORLD

in this issue

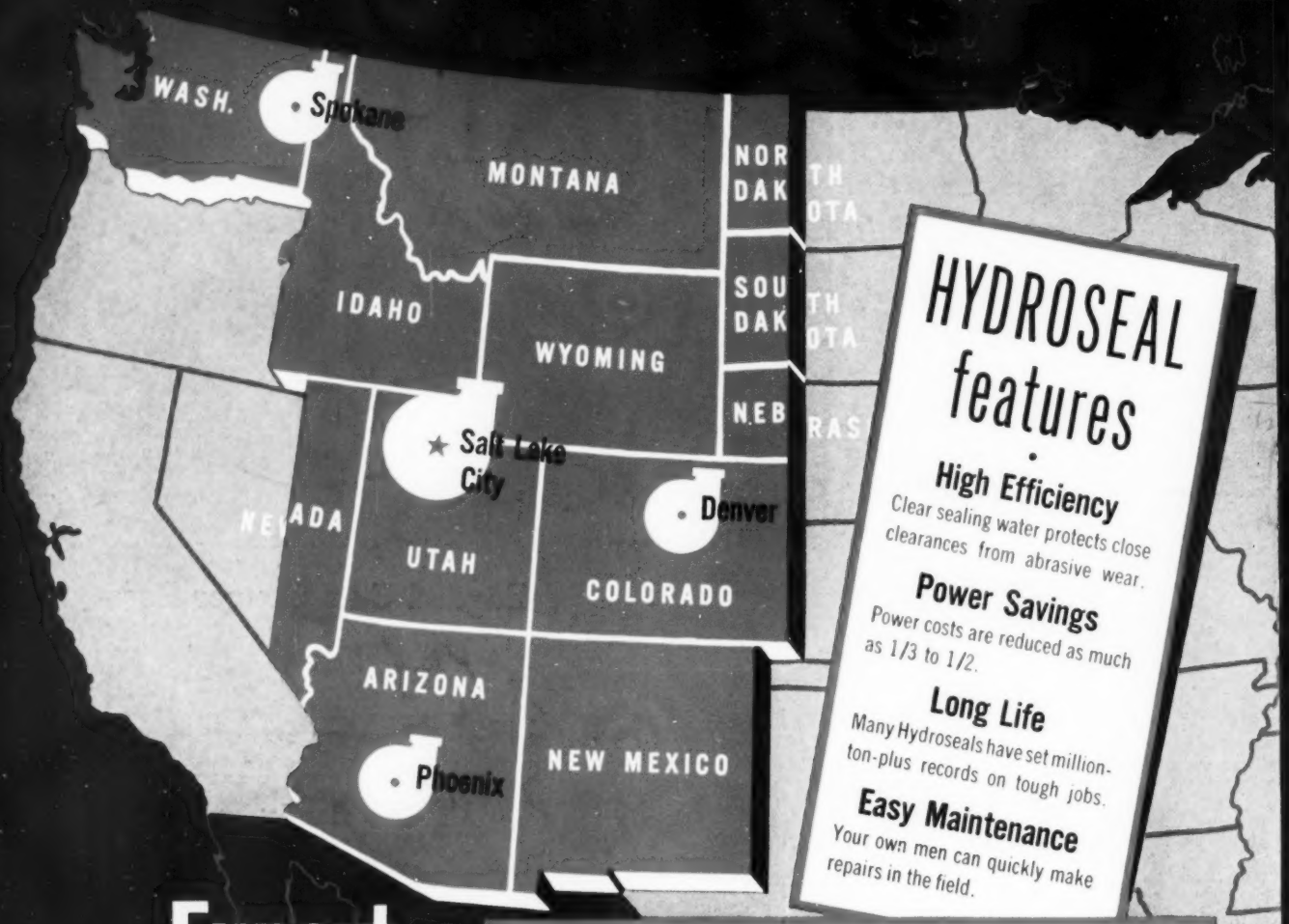
Bagdad Cuts Copper Loss

Page 30

MARCH 1952

Vol. 14 No. 3

35 cents a copy
In Sterling, 3s



HYDROSEAL features

High Efficiency
Clear sealing water protects close clearances from abrasive wear.

Power Savings
Power costs are reduced as much as 1/3 to 1/2.

Long Life
Many Hydroseals have set million-ton-plus records on tough jobs.

Easy Maintenance
Your own men can quickly make repairs in the field.

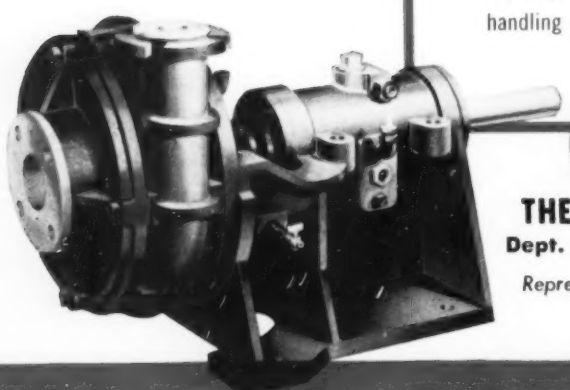
Expert abrasives-pumping service

The National Equipment Company, with Headquarters and Warehouse in Salt Lake City and with branches in Phoenix, Spokane and Denver, has served the mining industry in the Rocky Mountain area for over 30 years.

They are specialists in the application of HYDROSEAL Pumps.

Wherever fluid-solid mixtures are to be moved from one place to another there is a HYDROSEAL Pump to do the job and do it well.

HYDROSEAL engineering service is not confined to the Rockies nor are HYDROSEAL Pumps. Write us for help on your next abrasives handling problem.

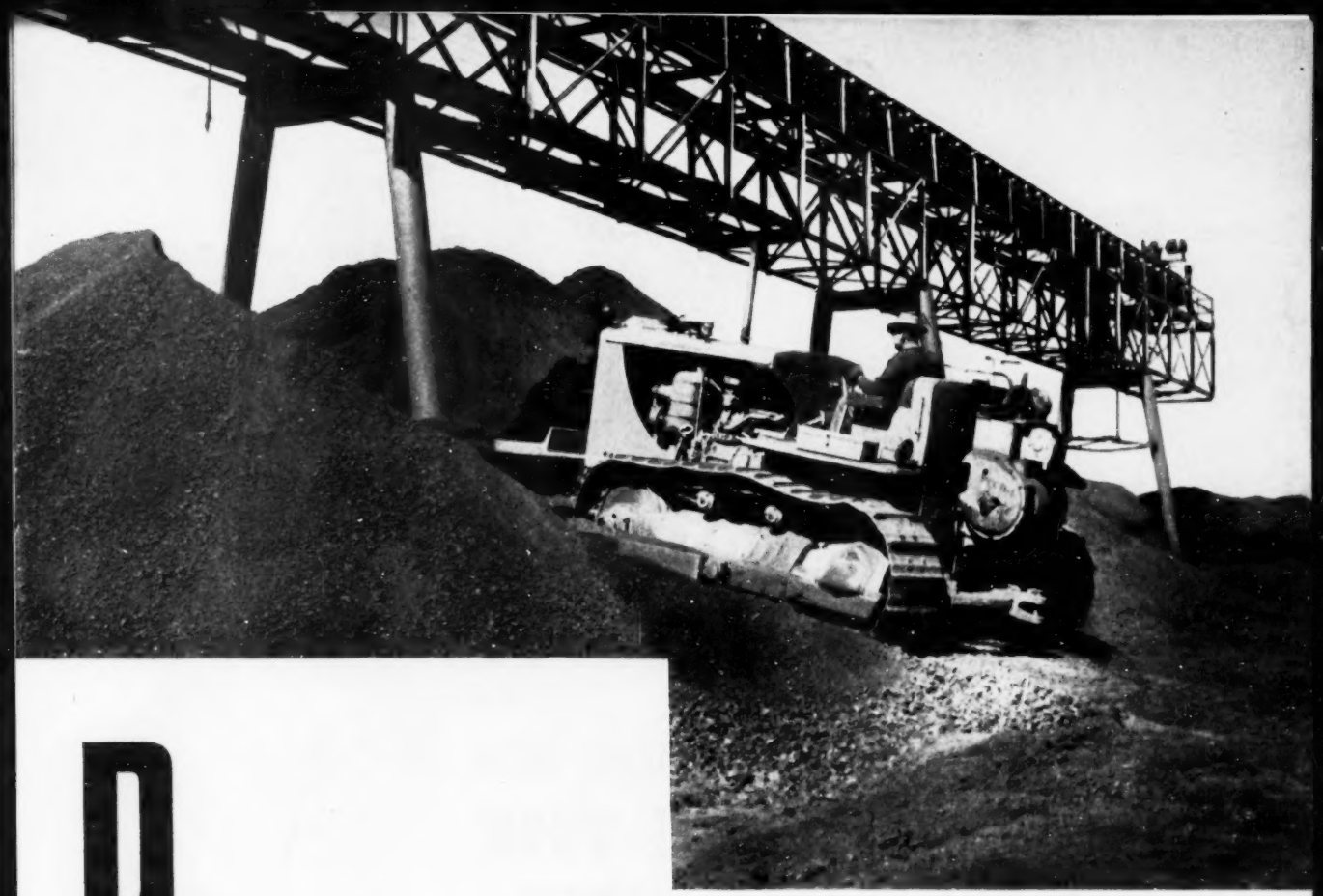


THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.
Representatives in Most Principal Cities

HYDROSEAL

SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD



Plenty of push

A dozen miles out of Cedar City, Utah, this "Caterpillar" Diesel D8 Tractor with matching No. 8A 'Dozer is slugging away on the roughest kind of job. Pushing iron ore into conveyor belts for loading into gondolas calls for plenty of brawn.

"This ore weighs 2½ tons to the yard," Superintendent Chris Mason of the Utah Construction Co., Cedar City, points out. "And when you buck it all day, day in and day out, and your equipment stands up—you have a good piece of machinery."

This "Cat" D8 Tractor and 'Dozer buck it eight hours a day, month after month, and there have been no repairs needed. That's why Superintendent Mason says, "For rough, hard work, when you're using 'Caterpillar' machines, you're using the best."

And just a few minutes' care each day will make even the *best* that much better—will keep your big yellow machines working harder and lasting longer. It's a good idea to consult your Operator's Instruction Book often. And call on your "Caterpillar" Dealer *before* wear can throw its punch. Proper maintenance today means full production tomorrow.

Caterpillar Tractor Co. • San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

MINING WORLD, March, 1952. Volume 14 No. 3. Published monthly, except April when publication is semi-monthly, at Emmett St., Bristol, Conn. Executive, advertising and editorial offices, 121 Second St., San Francisco 5, California. Subscription in United States, North Central and South America, $3.00 per year; other countries, $4.00 per year. Entered as second class matter Oct. 16, 1951 at the Post Office at Bristol, Conn., under the act of March 3, 1879. Postmaster: please send notice 3579 to MINING WORLD, 71 Columbia St., Seattle 4, Washington.

FUMEALL*

TRADE-MARK

the superior filter fabric for fume, dust and liquid filtration

SUCCESS STORY NO. 1! —From correspondence in our files.

"After nine months operation in high S.O. gas content on D+L sintering machine, Fume-All shows no loss of strength in either warp or filling... filtering characteristics are tops..."

What is FUMEALL?

FUMEALL is a combination of virgin wool and synthetic staple fibers. This combination gives the undisputedly superior filtering qualities of virgin wool plus the strength, heat, acid, alkali, and moisture-resistance of synthetic fibers.†

How long does FUMEALL last?

In actual operations, **FUMEALL** is lasting 4 times as long (and in many instances much longer) as conventional all-wool filter fabrics.

How much does FUMEALL cost?

The initial cost of **FUMEALL** is little more than any good all-wool filter fabric. Yet when measured in terms of longer life and superior performance **FUMEALL** costs far less.

How resistant is FUMEALL?

FUMEALL operates successfully in temperature ranges far beyond those permitted by conventional all-wool filter fabrics (225° to 300°), has greater fire-resistance than most synthetics. In intermittent operations, moisture absorption of **FUMEALL** is 50% or less than that of conventional all-wool filter fabrics, and shows greater resistance to acids and alkalis present in various filtered fumes and liquids.

What is the porosity of FUMEALL?

You can get exactly the porosity you want with **FUMEALL**, the right weave for your specific requirements. At present, **FUMEALL** is available in 4 different weights from most porous 14-oz. to least porous 24-oz. Finer or coarser weaves are available on special order, and **FUMEALL** can be napped or unnapped to conform to various operating conditions.

What about FUMEALL sizes?

FUMEALL is "tailored to your needs". Portland Woolen Mills will weave yardage or fabricate bags to any size and specification.

FumeAll is proving highly satisfactory for vacuum filtration in drum, disc and leaf type filters as well as bag type filters. Write or send coupon for samples and details.

INDUSTRIAL FABRICS DIVISION

Portland Woolen Mills, Inc.

P. O. Box 2620 • Portland 3, Oregon

*Patent pending

†DYNEL—a product of Carbide and Carbon Chemical Division of Union Carbide and Carbon Corp.

Industrial Fabrics Division
PORTLAND WOOLEN MILLS, Inc.
P. O. Box 2620, Portland 3, Oregon

Please send me additional details and samples of **FumeAll** suitable for
☐ fume collection ☐ dust collection ☐ liquid filtration

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

When are carbide insert bits best?

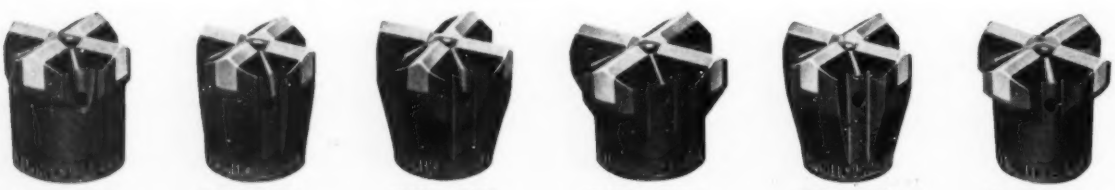
WHEN you run into drilling conditions like those listed below, you need carbide insert bits. Because carbide insert bits drill longer without sharpening, drillers spend less time changing bits. Crews can spend more time drilling. Bit reconditioning is simplified. And since carbide insert bits hold their gauge better, you can bottom the hole in the desired size without having to remove excess rock.

1. Extremely deep holes
2. Very hard ground where a steel bit will not drill out a full increment of drill steel.
3. Small blast holes
4. Constant gauge holes
5. Extremely abrasive ground
6. Block hole drilling in hard ground
7. Raise mining where space is limited
8. Locations where transportation and reconditioning of bits are problems.

What's the best carbide insert bit to buy?

TO be certain of getting the best carbide insert bits, look for the trade-mark "Timken" on the bits you buy. Timken® carbide insert bits are removable, screw on or off the drill steel easily. Driller is assured of sharp, uniform bits at all times without exchanging entire drill steel. And he can conveniently carry a full day's supply of bits.

You'll get more service from your Timken carbide insert rock bits because the bit body is made from electric furnace Timken steel. And because of the special shoulder union developed by the Timken Company, threads are not subjected to drilling impact. Timken carbide insert bits are available in six series. Our Rock Bit Engineering Service will help select the right one for your job. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



"SC" SERIES (⅝" thread) | "FC" SERIES (⅞" thread) | "MC" SERIES (1" thread) | "MCA" SERIES (1" thread) | "DC" SERIES (1 1/16" thread) | "DCA" SERIES (1 1/16" thread)

TIMKEN ***REMOVABLE ROCK BITS***

TRADE-MARK REG. U. S. PAT. OFF.

BUCYRUS ERIE

6-YARD 150-B *Brings* NEW SPEED, POWER, CAPACITY

To Loading and Stripping

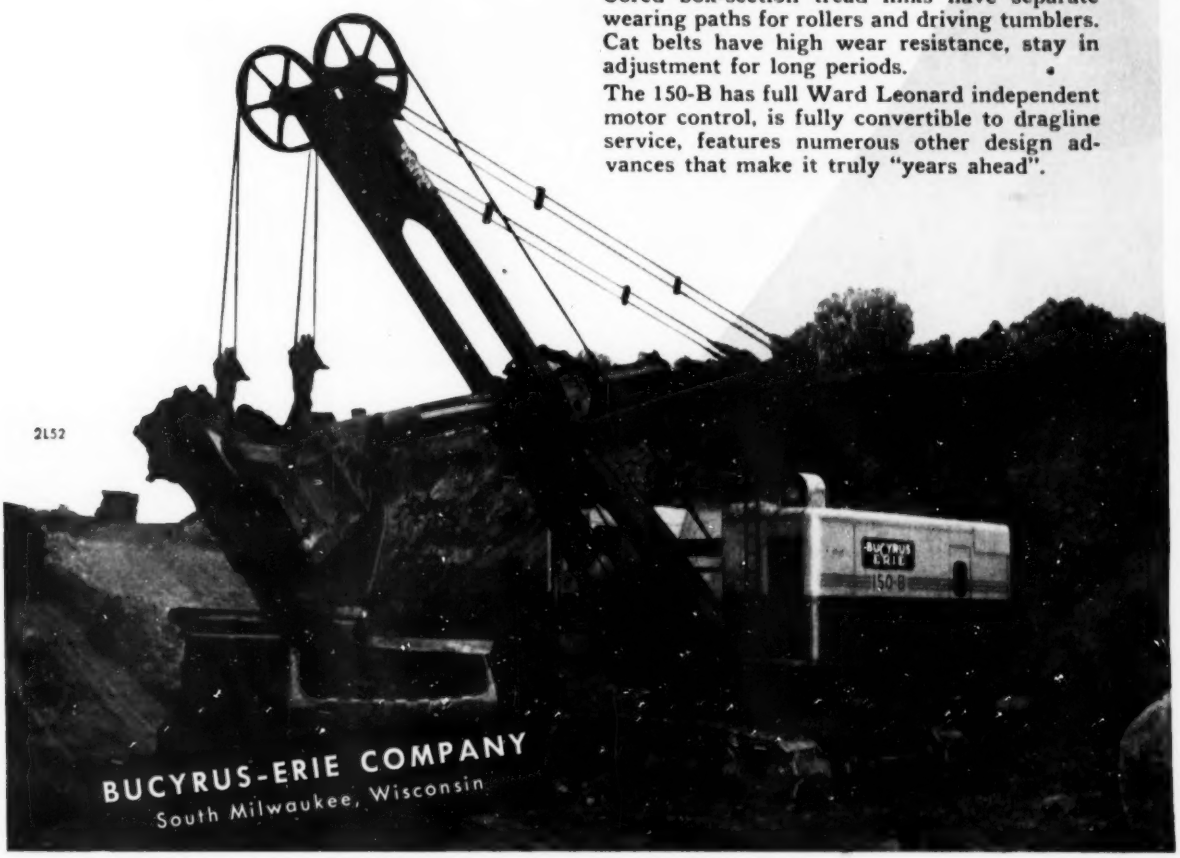
ADDED to the time-proved superiorities of design and construction which have made Bucyrus-Erie quarry and mining shovels traditionally "years ahead" are important features new to an excavator of this size, yet *thoroughly proved in the field*. Among these 150-B features are:

Exclusive Two-Section Boom with tubular dipper handle free to rotate in saddle block. Used with outstanding success on Bucyrus-Erie's large stripping shovels for many years, this design speeds the working cycle and permits increasing the payload because it reduces front end weight materially — yet provides enormous strength. Upper boom section carries only load resulting from pull of ropes, strong trussed lower section transmits directly to the revolving frame the vibrations, torsional and shock loads set up in digging. Rope crowd is quiet, positive, with crowd machinery located on the deck.

Powerful New Main Machinery designed for double twin hoist, smoothly delivers power where you want it, when you want it. Hoist machinery pulls dipper straight through tough banks with steady positive action. Fast smooth swing, with quick acceleration and deceleration, shaves seconds off every cycle.

Larger Stronger Mounting has new propelling machinery arrangement, which provides rapid engagement of the propel for fast move ups. Cored box-section tread links have separate wearing paths for rollers and driving tumblers. Cat belts have high wear resistance, stay in adjustment for long periods.

The 150-B has full Ward Leonard independent motor control, is fully convertible to dragline service, features numerous other design advances that make it truly "years ahead".



BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

It's New!

Le Roi-CLEVELAND

S11ST Offset Telescopic Leg Stoper

It's Fast!

...and sized right

3 Sizes – 28" - 40" - 52" Feeds

It's Tough!

Built *right* by the leading manufacturer of offset and roof-bolting stopers!

S11ST Stoper lengths range from 23" closed to 86½" open.

Only Le Roi-CLEVELAND S11ST gives you all these features for dependable, low-cost drilling

★ Convenient right-hand feed control provides the right feeding pressure for fast drilling in any rock.

★ Trip rotation release allows piston to strike straight, hammer-like blows.

★ Feed leg supported at backhead and chuck housing for extra strength.

★ Fewer packings to replace in air-feed leg means less trouble, easiest servicing.

★ Button in handle provides fast, positive feed release, for quicker, easier steel changing.

★ Constant blowing around front end prevents slush and cuttings from entering drill at front end and greatly reduces wear.

★ Water tube can be removed quickly —you don't have to dismantle the machine, just take off the backhead plug.

★ Shielded safety handle protects operator's hands.

★ Air consumption is low.

Standard Le Roi-CLEVELAND S11 Offset Stopers can be converted to this new telescopic type.

So get set for faster drilling and lower costs — standardize on these new stopers. Write for complete details.

LE ROI

LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION

12300 Berea Road, Cleveland 11, Ohio

Plants: Milwaukee, Cleveland and Greenville, Ohio

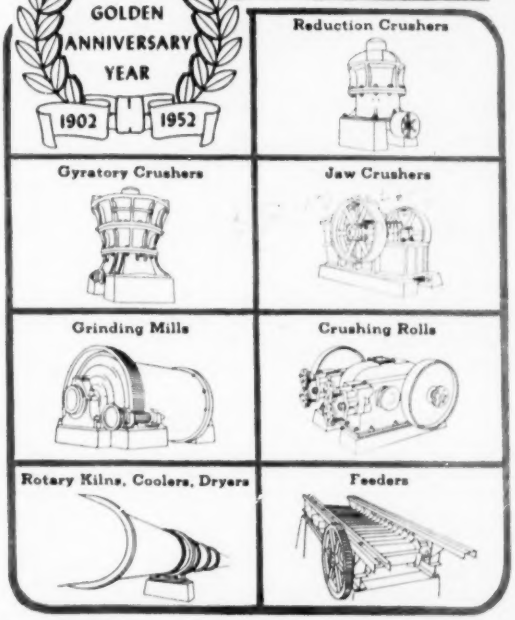
no more cars . . .

That was the problem faced 35 years ago by informed men in the automotive industry. They thought they could never produce over 900,000 cars per year. But today, car production runs in the millions.

The Traylor Type S Jaw Crusher features non-chokable smooth-faced curved jaw plates, which allow for greater capacity at finer setting and longer life of wearing plates. Seven sizes. For complete details, ask for Traylor Bulletin 125.

Fifteen years *before* this crisis in the automotive business, Traylor was busily developing better equipment to increase ore production. For 50 years, Traylor has worked to extend its lead in building the equipment needed by the mining industries. Modern mining depends on the constant improvement of machinery to maintain peak operating efficiency. With half a century of experience, Traylor stands ready to meet this need.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952



Traylor

ENGINEERING & MANUFACTURING CO.

453 MILL ST., ALLENTOWN, PA.

Sales Offices: New York • Chicago • Los Angeles
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

A TRAYLOR LEADS TO GREATER PROFITS

Can your rear-dump

Stripping bauxite in Surinam, Billiton Mines replaced their railroad network with 9 Tournarockers. In spite of 10% grades, extreme heat, and 120" annual rainfall, each unit delivers 150 cu. yds. of overburden hourly on 750' hauls.

Here's how these advantages pay off

Try one, buy two in California

Monolith Portland Cement Co. rented a Tournarocker for their mountain-face limestone quarry at Monolith. Its maneuverability over winding mountain roads, in restricted load and dump areas, and its output were so satisfactory the company bought *both* the first unit *and* another. The 2 Tournarockers now deliver 160 tons hourly on 400' cycles, all the shovel can dig.

Boosts output in Pennsylvania

Loaded with 15 yds. of clay, Tournarocker hauls 700' up 10% grades, 820' up 4% . . . strips 120 yards hourly for J. Robert Bazley, Inc. at their Mt. Carmel, Pa., mine. 4200' cycle is completed in 7.4 min. . . . smaller trucks take 7.9 min. for same trip. "We're particularly impressed with Tournarocker's clean dump and its safety when rear wheels are over bank," says Owner Bazley.

LETOURNEAU LET EQUIPMENT

R. G. LeTOURNEAU, INC., Peoria, Illinois

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

haulers compare with C TOURNAROCKERS ?

Turn around in a 13′ 9″ radius

When Tournarockers work a cramped rock job, there's no time wasted "backing all over the place" to load or dump. Because of its 2-wheel prime mover and positive-power electric steer, 18-ton Tournarocker turns in any footing within 13′ 9″ radius (less than half the rig's 29′ overall length), is ideal unit for work in restrictive quarters.

Eliminate tire breakage in rough going

Tournarocker load is carried by four 21.00 x 25 low-pressure tires. These big tires reduce rolling resistance of duals . . . are bigger, heavier, stronger than duals . . . better adapted to withstand load and haul shocks. They have no divided face to wedge in rock fragments that wear and tear. They roll easily over rocks that might concentrate entire load on one or the other of the lighter duals, and result in bruising or breaking the fabric.

Absorb punishment without costly repairs

Tournarocker's 3-ply, steel-grid bowl resists damage normally done when big-chunk rock is loaded. As a result, most welding and patching is eliminated. In addition, because Tournarockers have no frame, sub-frame, springs, spring hangers, drive shaft, front steering wheels or hydraulic system, many trouble spots are eliminated . . . spare part requirements reduced . . . maintenance costs kept down.

Work and turn on steep grades in safety

With positive power steer, and instant electric controls, and 4-wheel, multiple-disc air brakes (3763 sq. in. total braking surface, more than 4 times that of other haulers), loaded Tournarocker may be driven at high speeds down narrow, steep winding haul roads with complete safety.

Drive anywhere . . . dump safely over bank

Power-proportioning differential (which delivers up to 4 times the power to drive wheel on firmest footing) — plus the extra flotation and traction of giant tires — get rig through footing that stops conventional haulers. In addition, because it has power on front wheels, Tournarocker backs safely to edge of fill, dumps load clear over bank . . . eliminates most dozer clean-up.

Interchangeable for further profits

For other jobs, you can easily interchange the 186 h.p. C Tournarocker prime mover with 4 auxiliary hauled units . . . 14-yd. Carryall Scraper, 18-yd. bottom-dump hauler, flat-bed, and 15-ton crane. Other Tournarockers (9, 35 and 50-ton) may also be interchanged with similar trailing units, each costing about 25% of original unit price. Prime mover change takes only a few hours. This equipment travels via highway or cross-country to their assignments. Ask your LeTourneau dealer for full details.

"Carryall"—Trademark Reg. U. S. Pat. Off.
Tournarocker—Trademark ©1956m

Whips tight quarters in Sweden

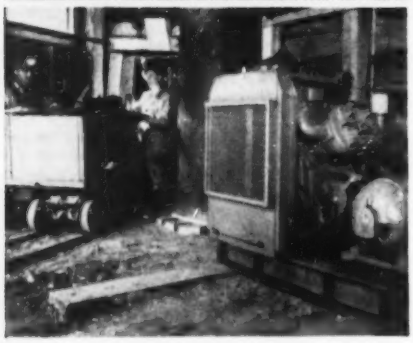
Svenska Vag Akt. and Nya Asfalt Akt. are nearing completion of a 785,000-yd. 36′ wide, 40′ high, and 2.9-mi. long underground tail-race tunnel in Gavleborgs Province. "Our Tournarocker is superior to other units," says Chief Project Engineer S. Westby. "Its greatest advantage is its maneuverability and 13′ 9″ turning radius."

Licks 10% grades in Arizona

Two 35-ton Tournarockers, stripping overburden for Bagdad Copper Corporation at Bagdad, Arizona haul loads, which by actual weight tests, average 37½ tons each. Time for each 4500′ cycle—including 2 min. to load, and 4½ min. to haul 2250′ (half of the distance up 10% grades) averages only 11.2 minutes. Dump time varies from 35 to 40 seconds.

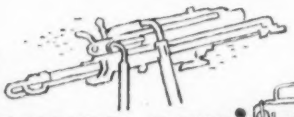
** Trademark
* Trademark Reg. U. S. Pat. Off.

122 or 186 h.p. TOURNADOZER*
14-yd., 18-ton TOURNAPULL*
18-yd., bottom-dump TOURNAHOPPER**
20-ton, flat-bed TOURNAHAULER**
15-ton lift TOURNACRANE*



Throughout the whole world of mining . . .

In large mines and small—wherever men are mining iron or gold, copper or tin, bauxite or carnotite—Gardner-Denver quality is helping to boost production—helping to hold down mining costs.



you'll find Gardner-Denver equipment on the job!

In some of the deepest mines of the world—at elevations of 14,000 feet—near the equator—just below the Arctic Circle—under all sorts of working conditions, experienced miners prefer Gardner-Denver Drifters, Stopers, Sinkers, Jumbos, Slushers, Mine Car Loaders, Compressors, Pumps and other mining equipment.

and Gardner-Denver service at your call

Experienced service specialists are always available for consultation on your mining problems, for help in planning your Gardner-Denver installation, or an efficient maintenance program. Gardner-Denver Branch Offices and Dealers are located throughout the United States, Canada and the world. You're never far from a Gardner-Denver man who knows your mining problems and how Gardner-Denver equipment can help you solve them. Call on him today, or write us for his name and address.

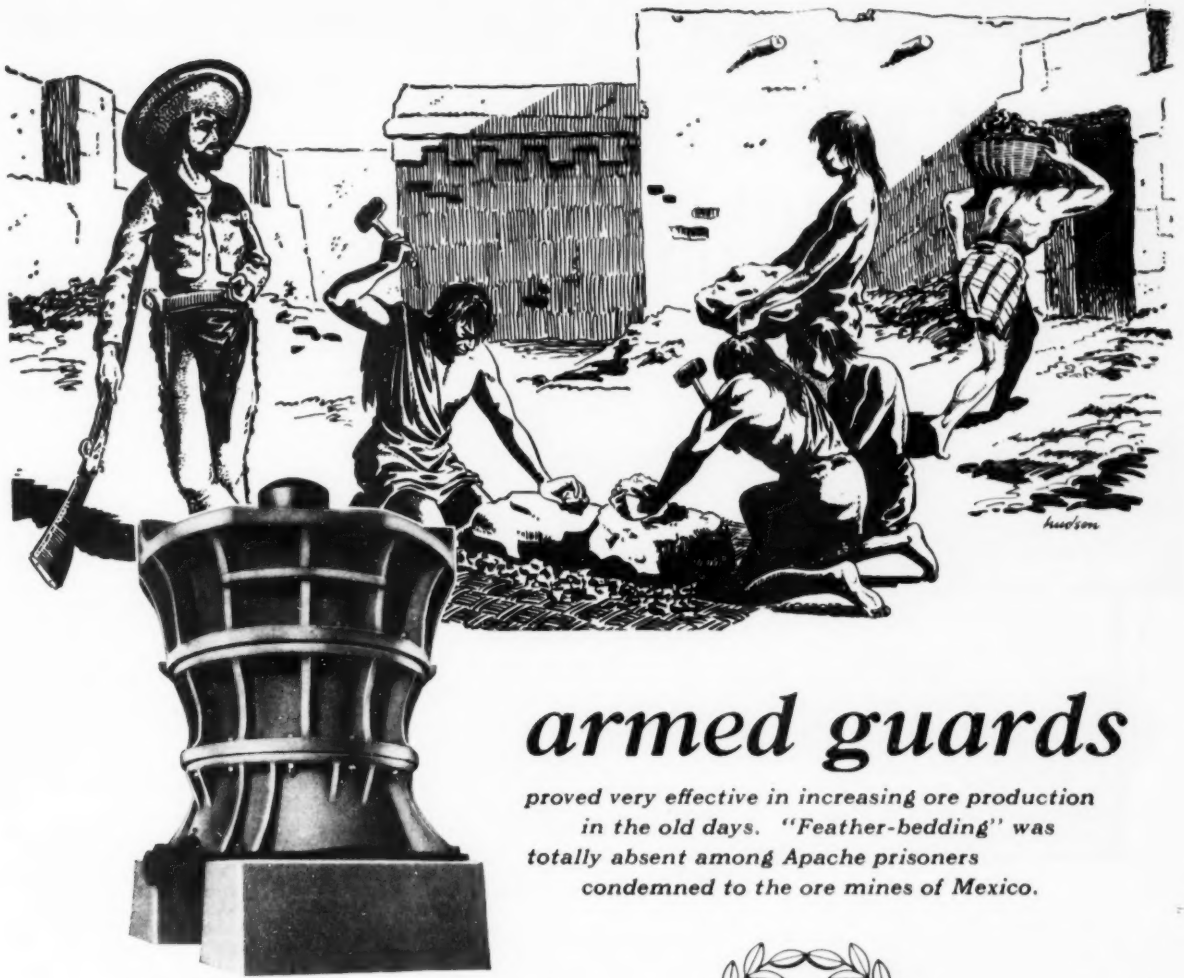
GARDNER-DENVER

SINCE 1859

Gardner-Denver Company, Quincy, Illinois

Export Division: 233 Broadway, New York 7, N.Y., U.S.A.
Gardner-Denver Company, Illinois, U.S.A.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

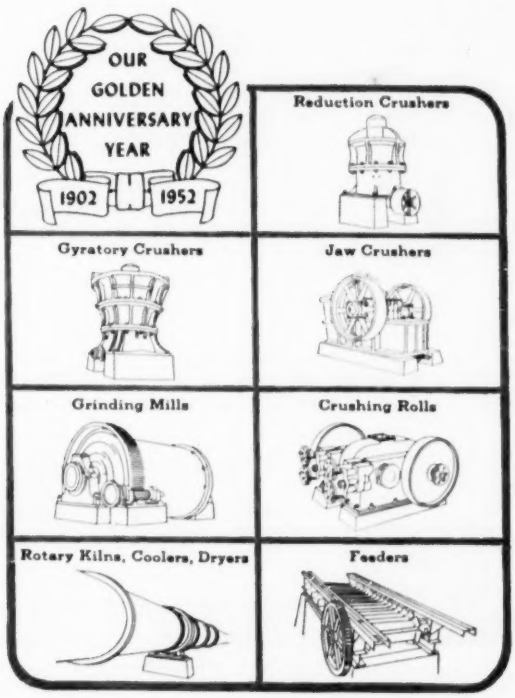


armed guards

proved very effective in increasing ore production in the old days. "Feather-bedding" was totally absent among Apache prisoners condemned to the ore mines of Mexico.

The Traylor TC Gyratory, with its curved concaves and bell head, is a perfect example of advanced crusher design. Bulletin 126 gives complete details.

THE PRODUCTION of ore has passed through many interesting and adventurous phases. For the past 50 years, Traylor has contributed to its growth and development. As the need for more efficient, more productive machinery increased, Traylor kept pace with constantly improved, more dependable equipment. By working with the mining industry for half a century, Traylor knows its problems . . . builds equipment "Traylored" to its needs.



Traylor

ENGINEERING & MANUFACTURING CO.
463 MILL ST., ALLENTOWN, PA.

Sales Offices: New York • Chicago • Los Angeles
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

A TRAYLOR LEADS TO GREATER PROFITS

GRAB SAMPLES From the Mail

Honored, Privileged

Dear Sir:

I feel honored with the privilege of receiving *World Mining*, a magazine with the greatest interest for those who in one way or another are dedicated to mining and especially for those who want to be up to date with the world's mining evolution and action.

Thanking you sincerely for the copies I have already received.

Victorio Angelelli
Mining Engineer
Donado 3946
Buenos Aires
Argentina

The World in General

Dear Sir:

I would like another year's subscription to *Mining World*. I enjoy keeping up with the world in general through the magazine.

Tolbert L. Swede Hansen
Trans Arabian Pipeline Co.
Dhahran
Saudi Arabia.

Grateful For Your Interest

Dear Sir:

I have learned, during the course of a recent conversation with Mr. deMagnee, professor at the Free University of Brussels, of the existence of your publication *World Mining*, which gives information on all of the new equipment that is manufactured in the United States.

Directing the Mineral Service of the Institute of Research of Iron and Steel, and in particular the Experimental Station that this service has installed at Saulnes, I would be very interested in receiving regularly your publication, and especially the October 1951 [Iron Ore Outlook Edition] issue that gives a report on the treatment of iron ores.

I would be very grateful to you if it was possible for you to add my name to the list of subscribers: Mr. L. Coche, Irsid Service Minerais, 6 rue de Lota, Paris 16.

Thanking you in advance, I ask you to accept, gentlemen, the expression of my best wishes.

L. Coche
Chief of the Mineral Service of Irsid Director of the Experimental Station of Saulnes

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Tops For News Items

Dear Sir:

I find your publication of great interest. Not only because of its informative technical articles, but even more so for its news items especially those pertaining to events and persons outside the United States.

I. L. Barker
Superintendent of Smelting and Refining
La Oroya Plant
Cerro De Pasco Corporation
La Oroya, Peru.

GRAB SAMPLES From the Mail

Purchasing For Tin Mining

Dear Sir:

We understand that you are the publishers of *Mining World* and not knowing the subscription rates, we are writing to inquire whether you will be kind enough to favor us with this information as we desire you to include our name as one of the subscribers. We would also appreciate it if you will kindly send us a complimentary copy by airmail as we are desirous of getting this magazine for purchasing certain mining equipment which we need for this big tin mining center.

G. H. Chua
Managing Diretcor
Guan Guan & Co., Ltd.
Bhuket, West Thailand.

A Request From Turkey

Dear Sir:

I have been receiving your publication *World Mining* regularly, and have followed the articles with a great interest. I have a friend here who is a mining engineer and has been active in mining operations and exploration for over 10 years. I would like to ask you to kindly put his name on your subscription list.

Kazim Ergin
M. T. A. Institusu
Ankara, Turkey

Handsome and Interesting

Dear Sir:

Many thanks for the copy of the February issue of your handsome and interesting magazine, in which appears the article on the Grängesberg Mining Company. We are very pleased with the layout you gave this article, and are pleased to see that you could make use of some of our photographs.

Do you think we could get three or four more copies of this issue, and also a number of tearsheets, to send to interested parties in Sweden? That would be most helpful.

Holger Lundbergh
The American-Swedish News Exchange, Inc.
630 Fifth Avenue
New York 20, New York

Constant Reader

Dear Sir:

As a constant reader of WORLD MINING for a good many issues I have found it an invaluable source of information on the latest developments in mining methods.

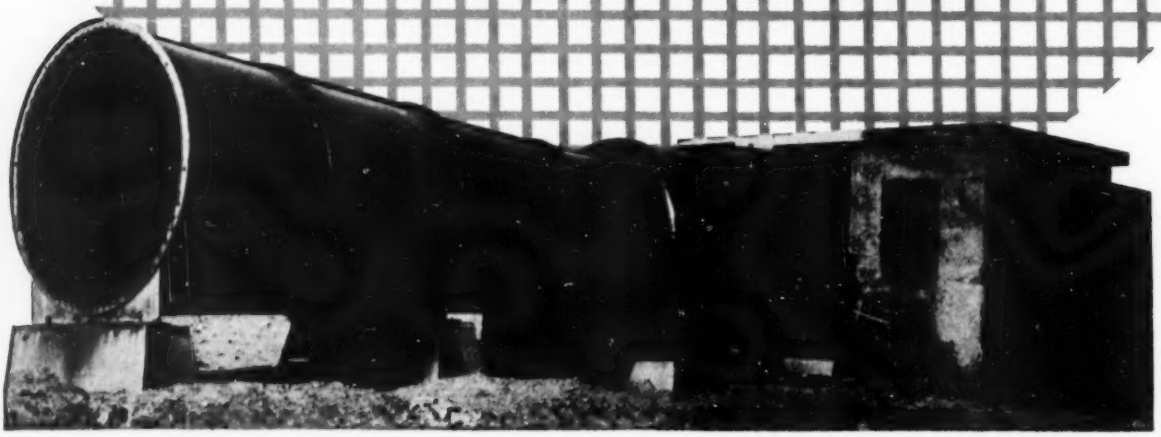
The magazine performs a splendid service for all of us who are interested in mines.

Francisco Cuevas Mackenna,
Casilla 3966,
Santiago, Chile.

JOY

AXIVANE® FANS

Do ALL your Ventilating Jobs MORE EFFICIENTLY!



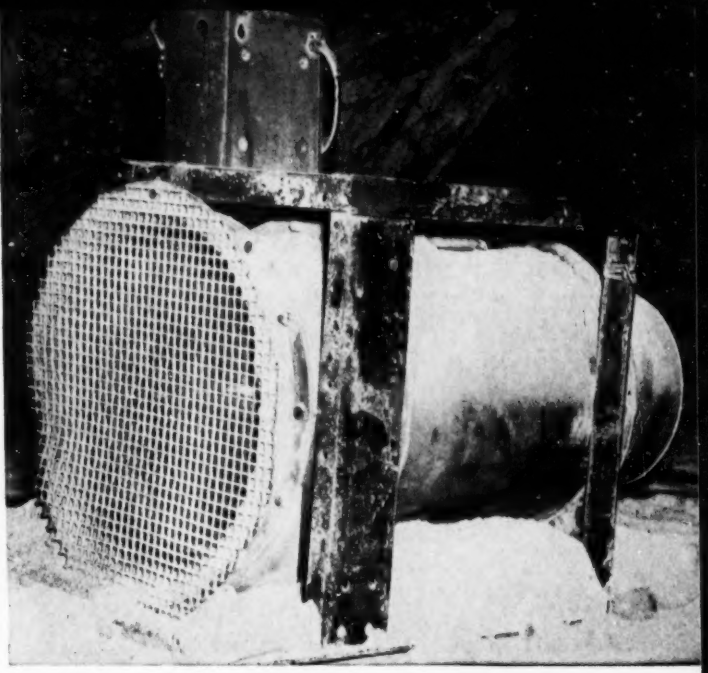
FOR MAIN VENTILATION—

JOY AXIVANE MINE FANS—the only fan with Simultaneously Adjustable Blades.

In the long run, you can count on more air at considerably lower overall cost with a JOY AXIVANE Mine Fan on the job. They're designed for lower speed operation and that means reduced maintenance and depreciation costs, because service life is increased and lubrication is simpler and more foolproof at lower speeds. What's more, you'll cut power costs with JOY's wide range of blade adjustment and simultaneously adjustable blades, giving you the highest possible efficiency over the widest possible operating range and eliminating guesswork settings. ● No matter how your air demand changes, you can always keep a JOY Fan at top efficiency. *Let us survey your ventilation problem—no obligation.*

FOR SECONDARY VENTILATION—

JOY Series 1000 AXIVANE FANS with Standard Adjustable Blades.

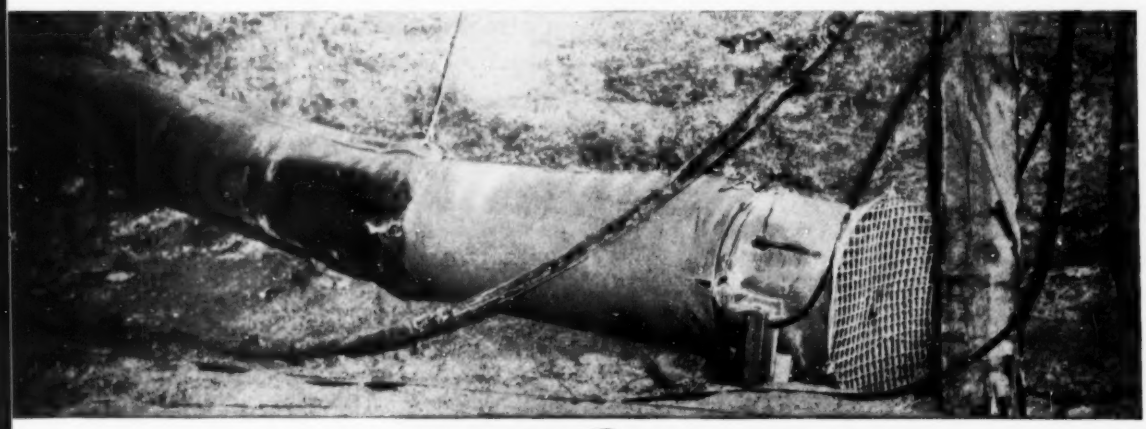


For smaller volumes, or where you may need additional capacity in a more or less permanent installation to supplement main ventilation, you'll find JOY Series 1000 AXIVANE Fans ideal. The vaneaxial design was pioneered by JOY in mine ventilation equipment. Series 1000 FANS are compact and space-saving, easy to handle and install, and relatively quiet in operation. They are the only fans in their class with adjustable blades as standard equipment, for your easy maintenance of peak efficiency over a wide range of air supply requirements.

FOR AUXILIARY VENTILATION—

JOY AXIVANE BLOWERS for either low or high pressure duties.

JOY AXIVANE Portable Blowers are all-purpose, two-in-one units. They not only provide smoother air flow and require minimum power, but operate with unmatched efficiency through any length of tubing. You don't need two types of blowers for different sections of the mine—JOY AXIVANE Blowers are suitable for either high or low pressure service. Available in types and sizes to meet every portable air supply requirement, and in electric or air-operated models.



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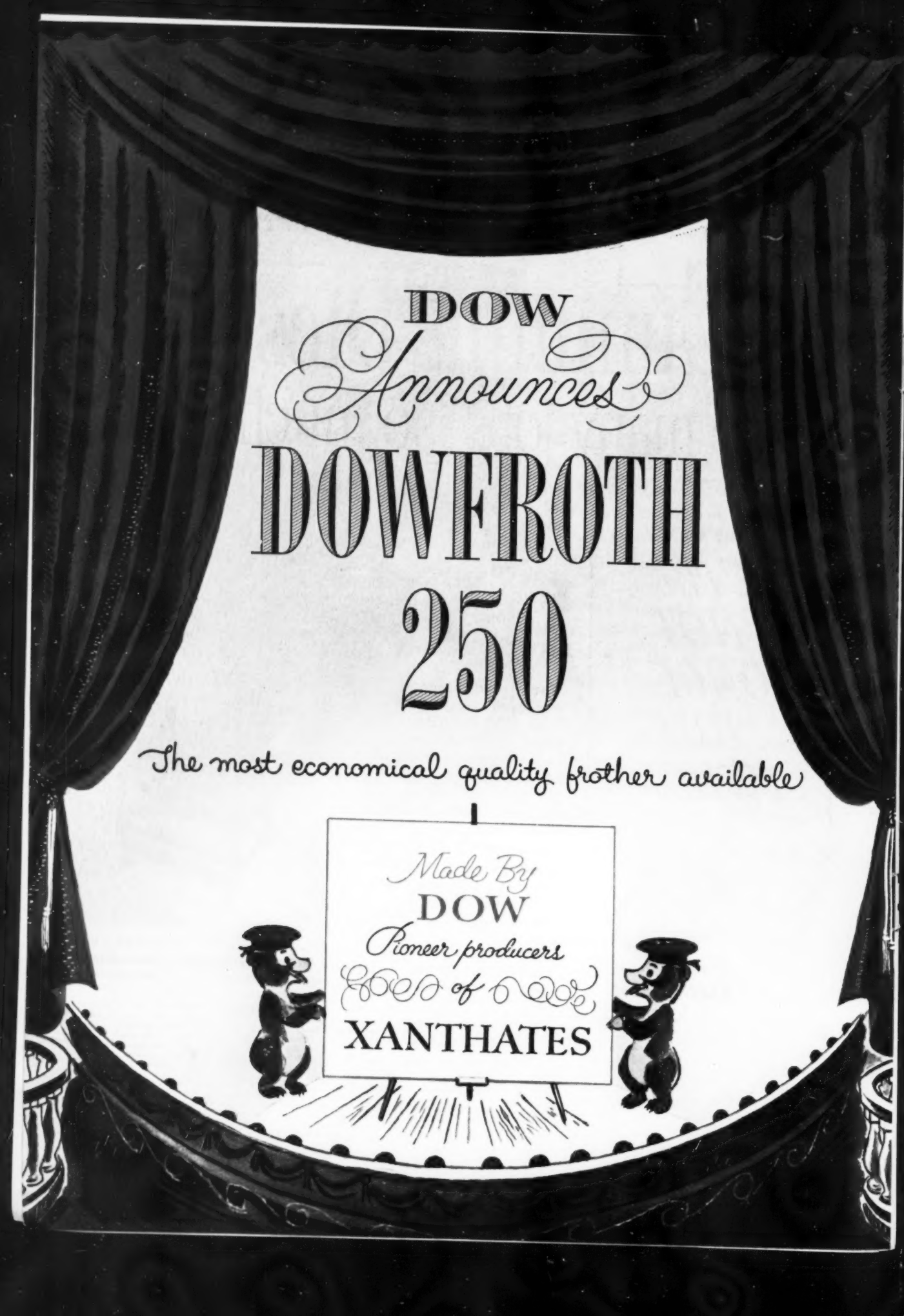
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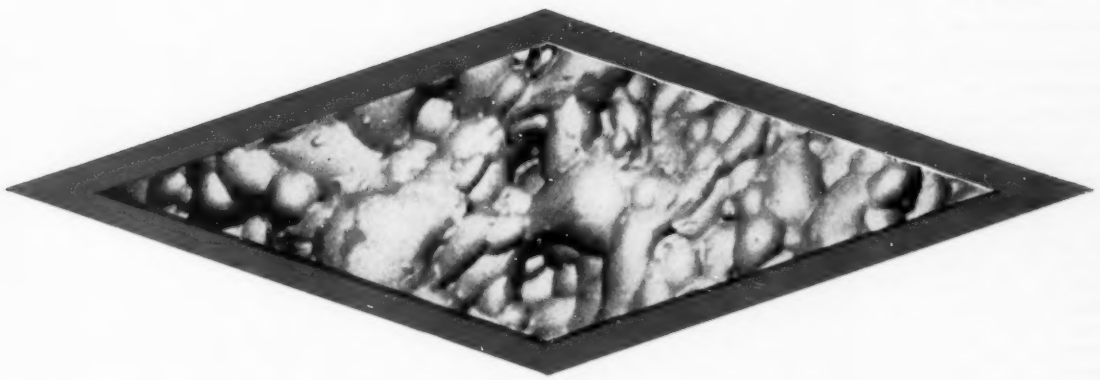

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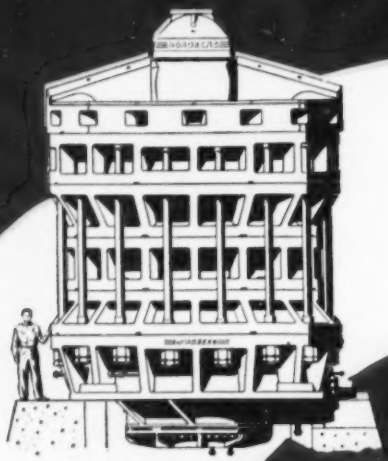

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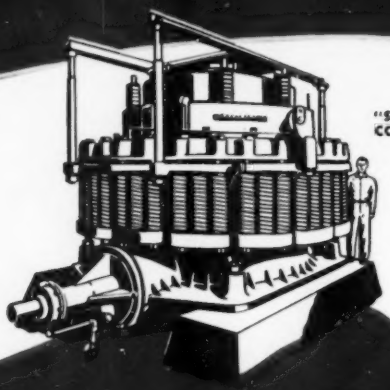
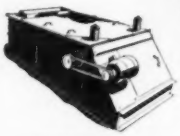
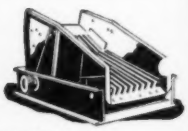


"SYMONS" CONE CRUSHERS



"SYMONS" VIBRATING SCREENS



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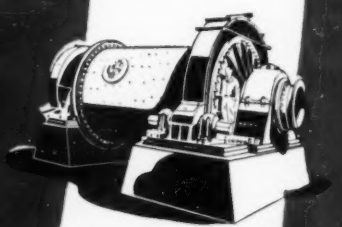
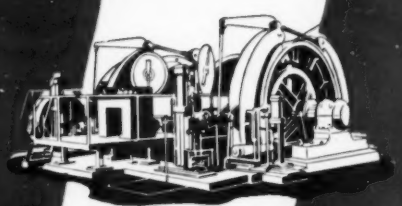
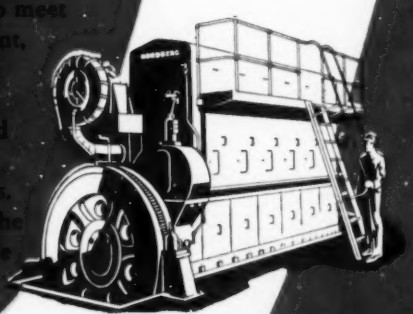
Write today for literature on the machinery you need to keep pace with the demand for increased production of *all* ores and industrial minerals.



GRINDING MILLS



MINE HOISTS



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MINING WORLD

and the export edition

WORLD MINING

A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

MARCH, 1952

VOL. 14 No. 3

SAMPLE LOCATIONS

COVER CIRCLE: Bagdad Copper Corporation's newly-expanded mill has increased copper recovery to an all-time high of 96.50 percent, largely through a closer control of pH, and has begun recovering molybdenite as a by-product.

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DRIFTS AND CROSSCUTS

SEE PEP Card on Yellow Page

So great has been the interest in and use of the Production Equipment Preview (PEP) section of *Mining World* by the mining and metallurgical industries and their employees that it is being continued as a regular feature.

In the June 1951 issue, a report was given on the widespread interest in PEP during the first 30 days of its existence. It will be recalled that a Prepaid Enquiry Postcard (PEP) mailed from Trondheim, Norway, travelled the greatest distance during that 30-day period. Very frankly, the Editors don't know which of the tens of thousands of cards mailed since that time now holds the distance record.

By sampling, assaying, and evaluating 1,000 of the returned cards, some interesting facts have been obtained which should be of interest to all who are connected with the minerals industries. Readers in 45 states and two territories returned the card. Ten states accounted for 58.5 percent of the enquiries. California miners must be the most interested in new machinery and methods because they led with 14.4 percent of the total. Perhaps, as some one has suggested, they were just more curious. The next nine states in order were Colorado, Arizona, Washington, Montana, Nevada, Minnesota, Idaho, New Mexico and Utah. You can best draw your own conclusion as to which kind of miner is on his toes in keeping up with research and new equipment. Colorado miners lead in uranium, vanadium, and molybdenum production. Arizona produces more copper, Montana more manganese, Minnesota more iron, Idaho more silver than any other state.

The interested engineers in foreign countries, and there were 254 of them, have best been described as mining in "those far away places with strange sounding names." How strange are some of the following countries where the 254 miners live? They are in alphabetical order:

Algeria, Argentina, Australia (6 States), Bechuanaland, Belgium, Belgian Congo, Bolivia, British Zone of Austria, British Zone of Germany, Canada (7 Provinces and Northwest Territories), Cape Province, Chile, Colombia, Cyprus, Cuba, Egypt, England (9 Counties), Egypt, Eire (Ireland), Federation of Malay States, Fiji Islands, Finland, France, French Guyane, French Morocco, French Zone of Germany, Gold Coast Colony, Greece, Honduras, Iceland, India, Italy, Japan, Kenya Colony, Madagascar, Mexico (14 States), Netherlands, Nicaragua, Northern Rhodesia, Norway, Nova Scotia, Nyasaland, Orange Free State, Panama, Pakistan, Peru, Philippine Islands, Portugal, Portuguese East Africa, Scotland, Spain, Southern Rhodesia, South West Africa, Surinam, Swaziland, Sweden, Tanganyika Territory, Tasmania, Thailand (Siam), Transvaal, Tunisia, Turkey, Union of South Africa, United States Zone of Germany, Venezuela, and Yugoslavia.

The Pep card appearing on the yellow page following the regularly numbered page 76 makes it easier for readers to take advantage of this service. Fill out the card today!

CAPITOL CONCENTRATES

HIGHER CEILING PRICE FOR DOMESTIC COPPER WANTED

President E. H. Westlake, of the Miami Copper Company, has gone on record urging the government to permit the domestic copper price to rise at least 3 cents a pound to the 27.5 cents a pound which foreign producers are now getting in the U. S. market.

Addressing the stockholders of his company in New York, President Westlake said that increased cost of operation brought about by the new pension plan and increased wages negotiated with unions in the Miami district, early last fall, had "diminished the spread between the cost of production and the selling price."

"In the case of Miami Copper Company," he said, "it is particularly important that its earnings be adequate to support a reasonable dividend and help provide the large amount of funds which are required for the development of our new Copper Cities property and other projects which the company has under consideration.

"Only by establishing a price of copper which will make possible the accumulation of funds for exploration and development of ore bodies can copper production in this country be quickly increased."

Westlake said that the only logical solution to the increased cost problem is for the government to lift the ceiling of domestically produced copper to 27.5 cents a pound, the same as the foreign producers are receiving. "The quality of American copper is just as good as foreign copper and the present two-price set-up looks too much like discrimination against American mines," he said.

Almost simultaneously, Mobilization Director Charles E. Wilson came out with a statement designed to quash reports that the domestic ceiling price of copper, 24.5 cents, might be boosted to the price which U. S. consumers are now paying for the Chilean metal, 27.5 cents.

The Mobilization Chief declared that "domestic ceiling prices for copper are now high enough to make most copper mining operations in the United States profitable—sufficiently profitable to assure high output." He did not say whether the present output is sufficiently high for defense requirements and to maintain a balanced economy.

• *Top Government Authorities Disagree*

Coincident with the announcement of Mobilization Director Charles E. Wilson that there would be no increase in the ceiling price of copper, Howard I. Young, deputy administrator of DMPA, called together the Copper Industry Advisory Committee to "consult with the government on a program to alleviate the severe shortage of copper."

Young described the present copper supply situation as "extremely serious," and urged the committee to present suggestions that would help step up production of the metal to a point where defense needs could be met and civilian production could be kept at a high level "for the economic welfare of the nation."

Even experts disagree.

• *Cabinet Post Proposed For Mineral Resources*

Following his oft-expressed dissatisfaction with the "ineffectiveness of the present defense minerals set-up, and the inability of the federal program to function," Representative Walter S. Baring (D., Nevada) introduced into Congress a bill, H. R. 5964, designed to establish a minerals department of the government, and to add a new member to the President's cabinet. The legislation is a drastic move toward separating the entire minerals division from the Department of the Interior.

"It is high time," Representative Baring remarked, "that we have a cabinet officer who can go to bat topside for the minerals industry, and who will not have to defend irrigation, reclamation and public power, as well. Mining has come into its own. In the early days the mineral industry represented, figuratively speaking, only a small tail on the economic dog. The tail is now beginning to wag the dog, for it is as big as the dog."

• *Contract-Settlement Issue Is Still Alive*

The contract-settlement amendment (which has been kicking around the Congress in one form or another since the failure of the 1944 Act to properly compensate miners for World War II claims) stands some chance of a favorable report from the House Judiciary Committee. Hearings were held last August and Representative Walters of Pennsylvania, who is steering the bill in the House, still takes an active interest in getting H. R. 3418 to the Floor for a vote. Its passage in the Senate would be practically certain, but getting it through the House Rules Committee is another matter. However, there is still some life in the old bill!

• *One Method To Obtain A Subsidy*

Until the Defense Production Act is amended, or until DMPA, DPA, and OPS see the light, there is only one way for a new copper property to take advantage of the over-market pricing policy. It will have to start up and ship, show a loss, and then go to DMPA and GSA for a contract to save the mine from shutting down. This device could result in a subsidy which would bring the price to the producer to over 30 cents.

• *RFC Grants Mine Loan*

What appears to be the first mining defense loan to be granted by RFC, after certification by DMPA, was announced by RFC in its release of January 16. The mountain has labored for a year and a half and the result is a loan of $50,000 to the Tungsten Mining and Milling Company of Spokane, Washington. The cost of the staff in one agency or another necessary to produce this magnificent result no doubt has exceeded a million dollars.

"Though the mills of God grind slowly, yet they grind exceeding small."

• *Over-Market Copper Contract Is Awarded*

GSA, at the instance of DMPA, has granted the first of a series of over-market copper contracts to the Calumet and Hecla Consolidated Copper Company. Four mines are involved, each with a different price ranging from 29.6 cents a pound to 31 cents a pound. Even in this case the press department of DMPA could not resist the chance to exaggerate. In a quote attributed to Jess Larson, it stated: "More than 1,000,000 pounds of copper per month will be *added* to the supply available to industry." It should have said that the contracts will prevent the copper from being lost to industry by keeping the mines from being shut down.

• *Manganese Stations Get Little Ore*

Although the manganese buying stations at Philipsburg and Butte, Montana, and at Deming, New Mexico, were opened on November 19 to receive ores under the purchase program originally announced in July, they have not been doing much business. As of January 11, almost two months after the stations were opened, the Philipsburg depot took in 202 tons of ore and the Butte station received 24 tons. Up to January 5 the station at Deming had reported an intake of 1,442 tons.

This is a mighty poor showing when the Defense Materials Procurement Agency stated that applications to participate in the program totaled 561, of which 167 were received at the Seattle Regional Office of GSA and 394 were filed with the Denver office. The small receipts of ores would indicate that the good intentions of many applicants were destroyed by the additional "deducts" which were imposed at the time of announcement of the opening of the stations and which had not been indicated in the original program announced in July.

It makes one wonder whether or not the defense program really wants manganese ores as badly as is implied by the government agency's press releases.

• *Auto Industry Wants More Copper*

The automobile industry has been allocated enough copper to make 800,000 cars this year. The manufacturers would like to make 930,000, and are permitted to do so by NPA, but that total would take 2,500 tons more copper.

A government agency intimates that if the auto industry wants to make more cars than can be made with the metal allocated to it, the additional metal could be obtained from mines outside the United States. The agency frankly stated that the manufacturers would probably have to pay 44 cents a pound, but pointed out that this would only be an additional cost of less than $1.00 per car.

It is a ridiculous situation when a government spokesman suggests to a copper user that he go outside the United States to get his required metal and that he pay foreign producers 44 cents a pound when we have a price ceiling for the metal in this country of 24.5 cents a pound and a lot more metal would come out of new domestic mines if the ceiling price were hiked a bit, or a premium paid for new and additional production.

What this country needs badly is more taxpayers, and this would be an intelligent way to get them. There is considerable copper available in this country which could be obtained for far less than 44 cents a pound, but it will stay in the ground as worthless rock at the present ceiling price of 24.5 cents a pound.

COMING CONVENTIONS

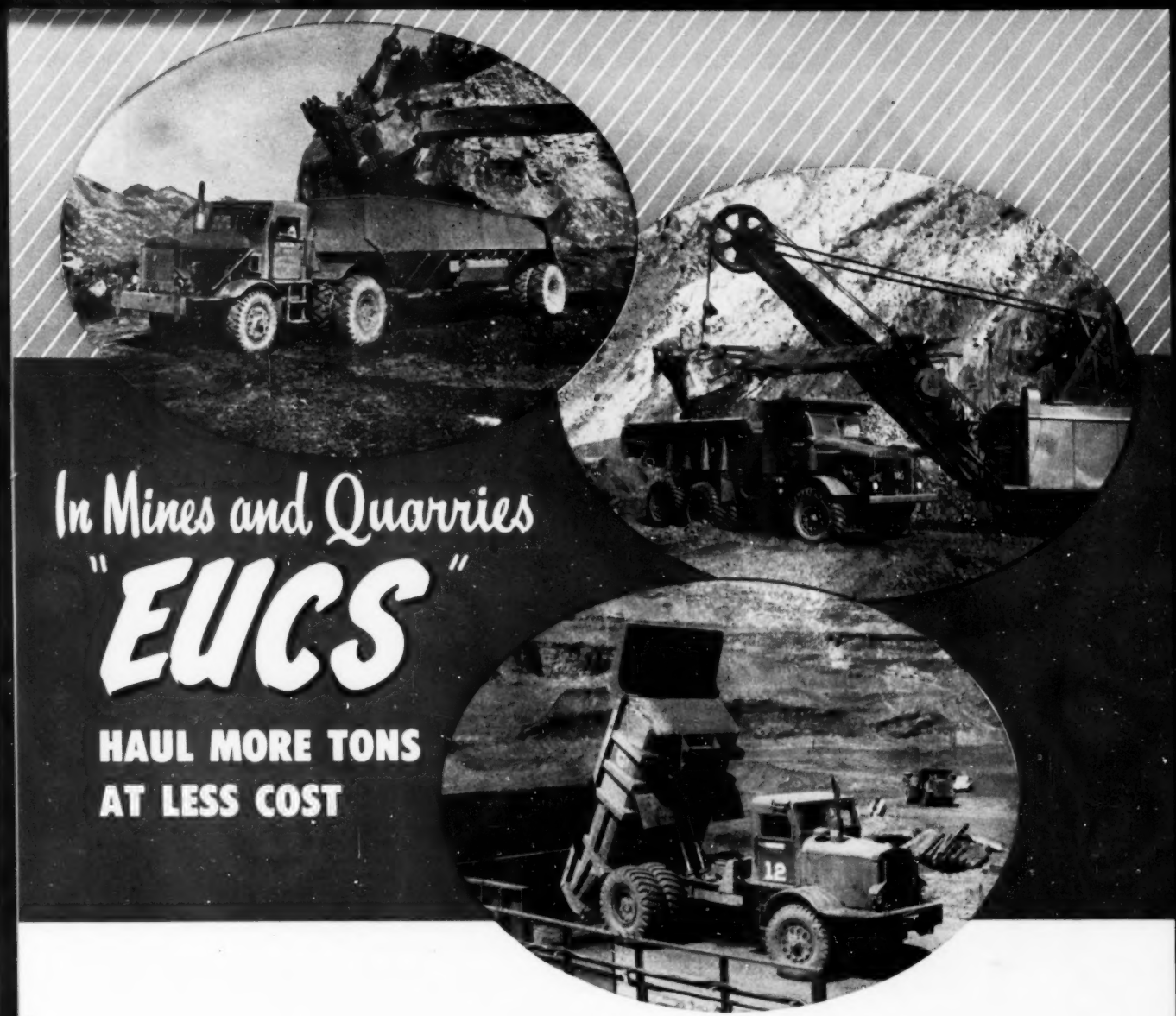
April 11 and 12, 1952. Western Mountain Section, GEOLOGIC SOCIETY OF AMERICA, University of Arizona, Tucson, Arizona.

April 18 and 19, 1952. Annual Meeting LEAD INDUSTRIES ASSOCIATION, Drake Hotel, Chicago, Ill.

April 21 and 22, 1952. Annual Meeting AMERICAN ZINC INSTITUTE, Hotel Statler, St. Louis, Missouri.

April 21 through 23, 1952. Diamond Drilling Symposium arranged by the Chemical, Metallurgical and Mining Society of South Africa and the Diamond Research Laboratory, Johannesburg, Union of South Africa.

September 8 through 15, 1952. XIX Session INTERNATIONAL GEOLOGIC CONGRESS, Algiers, Algeria.



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DAILY GREASING PERIODS ELIMINATED. You save at least 30 minutes every day . . . gain about one full month's production every year.

FULL PROTECTION ASSURED. Positive Seals keep grease in . . . dirt and moisture out. 1000-Hour Lubrication gives you protection unchallenged in the tractor field.

SAVES ON GREASE. Truck wheels, idlers and support rollers are grease-filled at the factory . . . need new grease only once every 1000 hours!

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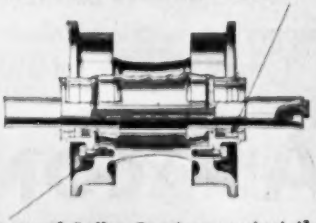

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DESIGNED FOR YOUR JOB • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE

A Statement by Anaconda on the Copper Situation

MANY users of copper have vital decisions to make . . . usually in connection with the present defense-induced shortages of copper and aluminum. This statement is an effort to remove the smoke screen surrounding the copper picture . . . to wipe away the confusion caused by too much talk supported by too few facts.

Substitution poses problems – Industry has been urged to substitute aluminum and other materials for copper. In some instances this may be logical and practicable. In many others it is difficult, if not impossible. But – before making *any* long-term decisions that may cost a great deal of money in engineering, new plant facilities or rescheduling of production operations – one should know the facts about the future of copper.

New Anaconda projects – The first major increase in copper production will come from Anaconda when the Greater Butte Project and the new Sulphide Plant at Chuquicamata, Chile, begin operations this spring. By 1953, these two projects should raise present levels of copper production by about 95,000 tons yearly.

Toward the close of 1953, Anaconda's new Yerington project in Nevada is expected to start producing at an annual rate of 30,000 tons. By then, Anaconda will be adding to the present yearly copper supply at the rate of about 125,000 tons.

Other new projects – During 1954-55 still other new projects in the U. S. and friendly foreign countries will further augment the increasing copper supply. All told, it is estimated that by 1955, not less than 450,000 tons of copper could be produced annually – over and above present production levels.

Accordingly, in 1955-56, domestic production plus imports could bring the U. S. copper supply to 1,800,000 tons yearly. This would represent an increase of about 20% over present levels. Based on historical comparisons, and barring a large-scale shooting war, this amount of copper could support a Federal Reserve Board Index of Industrial Production of 270, an increase of 24% over the present, and 45% above the first half of 1950.

• • •

These are the 'things to come' in copper. On the basis of the facts there is no necessity for considering long-range substitution of other materials for the red metal.

52320A

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INTERNATIONAL PANORAMA

DENVER—Lead and zinc production in Colorado during 1951 was the largest in history dollarwise. The 30,400 short tons of lead were valued at $10,396,800 and the 55,700 short tons of zinc at $19,940,600.

MOSCOW—Production of steel in the Soviet Union in 1951 exceeded 31,000,000 metric tons.

GRAND JUNCTION, COLORADO—Exploratory drilling for uranium ore in 1953 by the United States Atomic Energy Commission will be increased 21 percent over the 1952 footage. The increase over 1951 drilling will be 240 percent.

LA PAZ—Compagnie Aramayo de Mines en Bolivie has received a loan of $580,000 from the United States Export-Import Bank. Loan funds will be used to increase tungsten production at the company's Pucuni mine. The United States will buy tungsten from the mine from 1952 to 1954.

GILMAN, COLORADO—In 1951 the Eagle mine of the Empire Zinc Company produced more zinc—more than 29,000 short tons—than in any year in history.

ISHPEMING, MICHIGAN—The Mather mine—largest underground iron ore mine in the United States—broke all production records during 1951. Production was 1,635,256 tons.

OTTAWA—Canadian production of iron ore during 1951 reached an all time high of 4,736,190 tons.

CORPUS CHRISTIE, TEXAS—Reynolds Metals Company is building a 1,000 ton per day alumina plant near here at a cost of $42,000,000. The plant will process ship-delivered bauxite from the Company's Jamaica mines.

BEAVER BAY, MINNESOTA—The first certificates of necessity to permit rapid tax write offs for taconite production have been awarded to the Reserve Mining Company. Certificates totalling $112,557,870 permit 75 percent rapid amortization on plants under construction at Babbitt, and Beaver Bay.

DULUTH—During 1951 4,665 ship loads of iron ore cleared this port for Lower Lake ports.

HOUGHTON, MICHIGAN—The Defense Materials Procurement Agency has signed a contract with the Calumet & Hecla Consolidated Copper Company which will permit the company to increase copper output at its Iroquois, No. 4 Kearsage, Peninsula, and Allouez No. 3 mines. Payments up to 31 cents per pound will be made for copper by DMPA.

GRANTS, NEW MEXICO—The Anaconda Copper Mining Company will build and operate a uranium processing plant near here. All uranium output for the first five years of operation has been contracted for by the United States Atomic Energy Commission.

OTTAWA—The Canadian government is paying incentive prices for cobalt ores and concentrates to stimulate production. The new prices are: $1.20 per pound of contained cobalt in ores or concentrates containing from 7.00 to 7.99 percent cobalt up to $2.00 per pound for 10.00 percent and over.

TANGANYIKA—Uruwire Minerals, Ltd. will receive a $1,640,000 advance from the Mutual Security Agency, acting on behalf of the United States Defense Materials Procurement Agency, to increase lead and copper production at the Mpanda mine.

CALCUTTA, INDIA—The first silver refinery in Asia is scheduled to be built at Alipore in the suburbs of Calcutta. Production will start late in 1953.

CLEVELAND—Republic Steel Corporation produced 9,147,000 tons of steel during 1951 to establish a new Corporation record.

TORONTO—Hollinger Consolidated Gold Mines is recovering tungsten (scheelite) from certain of its developed gold-bearing veins. The known tonnage of this ore is reported as small.

SHAWINIGAN FALLS, QUEBEC—The first of 80 railroad carloads of aluminum ingots totaling 8,800,000 pounds has been shipped to the United States under the United States-Great Britain agreement. This agreement calls for Canadian shipments of English aluminum at the rate of 4,400,000 pounds for five months.

HOBART—Tin mining is increasing in Tasmania and plans are underway to expand production at the Briseis open-pit mine of Briseis Tin, N. L. at Derby.

ROME—The Societa per Azioni Piombo e Zinco (SAPEZ) will construct a zinc ore plant at Nossa, Bergamo province. European Recovery Plan funds will be used to finance the project.

KUALA LUMPUR—The Japanese firm, Sangyo Kaihatsu, is planning to develop iron ore deposits in Kelantin and bauxite deposits in Johore.

CHALMETTE, LOUISIANA—Kaiser Aluminum & Chemical Corporation's new aluminum plant has gone into operation just 10 months after plant construction started. The first of eight potlines is producing aluminum with annual production of 400,000 tons scheduled for 1953.

ANKARA—Large deposits of wolframite ore recently discovered at Uludag in Bursa are being developed.

BAXTER SPRINGS, KANSAS—The MacArthur Mining Company is doubling capacity of its zinc-lead mill to 650 tons daily. A loan of $45,000 from the DMPA and a contract to buy up to 1,500 tons of slab zinc at 17.5 cents per pound are financing the expansion.

PITTSBURGH—A record production of 105,000,000 tons of steel ingots was made by the United States' steel industry during 1951. Output in 1950 was less than 100,000,000 tons.

LA PAZ—The Bolivian Tin and Tungsten Mines Corporation has secured a loan of $1,000,000 from the United States Export-Import Bank. The money will be used to finance expansion of tungsten output of the Corporation's Kami tungsten mine in Ayopaya Province and the Araca tungsten mine in Loayza Province.

DMPA Premiums To Keep C & H Copper Mines Open

Calumet & Hecla Consolidated Copper Company has been granted the first government contract to keep four of its highest-cost mines in operation. The Defense Materials Procurement Agency has agreed to pay from five to six cents over the established 24.5-cent ceiling "in order to bring specific losing operations of the company up to the breakeven point."

The payments relate only to the copper production from the company's four mines in Northern Michigan which have been operating at a loss for the past year. In November 1951, the company had reached the position where it felt it would have to close down operations. This situation had been brought about by higher wages, increased supply costs, and a decline in the grades of ore mined. With copper so scarce, and with the Office of Price Stabilization's steady refusal to raise the ceiling price, the DMPA stepped in with its program.

The contract covers a period of 12 to 17 months and involves a monthly copper production rate of approximately 500 tons. Termination dates are based on known reserves and extend from December 31, 1952, through May 31, 1953.

DMPA will make up the difference between ceiling price and the following prices at Calumet's mines: Iroquois mine, 30.5¢; No. 4 Kearsage, 3.10¢; Peninsula, 29.6¢, and Allouez No. 3, 29.7¢.

Reynolds' Jamaican Mines Will Ship In September

Development of the tremendous bauxite reserves in Jamaica, British West Indies, is being completed by Reynolds Jamaica Mines, Ltd., a subsidiary of the Reynolds Metals Company. The Carribbean deposits were originally explored by Reynolds geologists and subsequent development was assisted by loans from the Economic Cooperation Administration.

The construction of a pier, storage bins, an overhead tramway, and processing and power plants, when finished, will enable Reynolds to ship 750,000 tons of crude ore annually. Shipments are scheduled to begin arriving at United States ports in September of this year.

The ore will be carried by a new self-unloading, 13,000-ton ship purchased from the British Maritime Service, and is to be processed at Reynolds' plants in Arkansas and Texas. The new plant near Corpus Christi, Texas, now building, will be one of the few plants in the world producing aluminum metal from crude bauxite.

The cryolite necessary to produce aluminum from the Jamaican ore will be made from acid-grade fluorspar mined and processed near Salida, Colorado at Reynolds' newly purchased Poncha Springs mine and flotation mill.

The Bagdad copper-molybdenum flotation mill. High recovery at low cost set the pace for other operators to equal.

BAGDAD EXPANDS COPPER MILL— RECOVERS BY-PRODUCT MOLYBDENITE— UPS COPPER RECOVERY BY pH CONTROL

Bagdad Copper Corporation's sulphide-copper flotation mill, at Bagdad Arizona, has recently been revitalized in much the same way as the Bagdad mine (see September, 1951 *Mining World*). The main feature of the mill improvement was a system of pH Control which boosted recovery of sulphide-copper by 10 percent. Result: a 10 percent increase in income with no increase in operating cost.

It all started early in 1950. At that time, Gaylen Guest was appointed metallurgist of Bagdad. The Bagdad mill (a sulphide mill which is not designed for recovery of copper oxides) was making a recovery of about 87.6 percent; the 12.4 percent tailing loss was regarded as a necessary evil. Mr. Guest studied and researched the problem, came up with an answer, and in May and June of 1950 made drastic changes which resulted in an overall recovery of 96.50 percent. At that time a new grinding-classification circuit (Marcy 89 grate-discharge cylindrical ball mill and Wemco 72-inch by 33-foot spiral classifier) was added to the three existing grinding circuits, and new flotation cells (Fagergren) were installed throughout the plant.

Lime Feed

The key to Mr. Guest's system of high recovery was pH control—very close control—which also involved the additional controls of density and initial ore feed. He found that the optimum pH for flotation of Bagdad's ore was 11.5, which indicates rather high alkalinity. The main trouble he found was that alkalinity was by no means constant, and was hard to keep constant. The ore contained some zones and streaks with a high percentage of copper sulphate which is acidic; whenever mill feed was from a copper sulphate zone, the pH fell to a much lower figure than the optimum 11.5.

LOW COST — HIGH RECOVERY

COARSE GRIND. Because of the lack of barren iron pyrite in the ore. Grate discharge mills helps get out the quick grind.

LOW TAILING. Extremely low sulphide tailing equals high recovery. Absolute control of pH (11 to 12) has reduced tailing assay from 0.10 to 0.12 percent copper down to 0.03 percent.

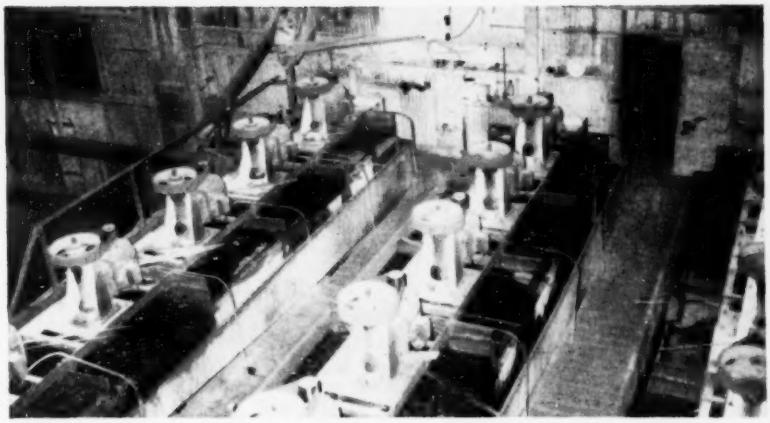
LOW BALL CONSUMPTION. Only 1.6 pounds per ton of ore. Partially a result of the coarse grind.

HIGH RATIO OF CONCENTRATION. About 41 to 1, reduces freight costs.

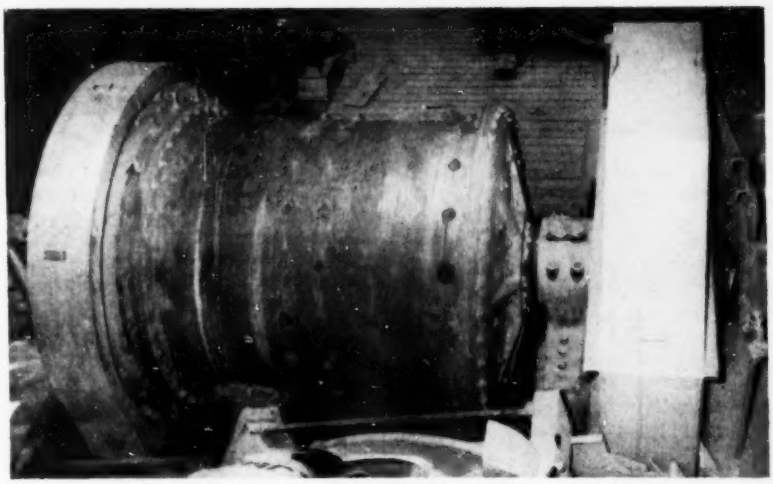
CONTINUED, CONSTANT pH CONTROL. Hourly checks of pH at classifier overflow and rougher cell tailing. Variable lime feed to maintain average of about 11.5. Ore varies. Some of it may contain copper sulphate which would make circuit acidic.

DO NOT THICKEN THE TAILING. Marooney tailing dam does that job. Discharge near the dam, and at a point upstream clear water is returned to mill feed.

A. T. Weatherhead, flotation operator, dips a sample from the overflow of No. 4 classifier, an 8 by 33 foot duplex Dorr rake-type classifier.



ABOVE: Three banks of six 66-inch Fagergren cells are the rougher flotation units in the mill. Cleaner cells are on the lower floor on the left. BELOW: This Marcy 89 cylindrical grate-discharge ball mill permits free pulp overflow with a minimum of over grinding.

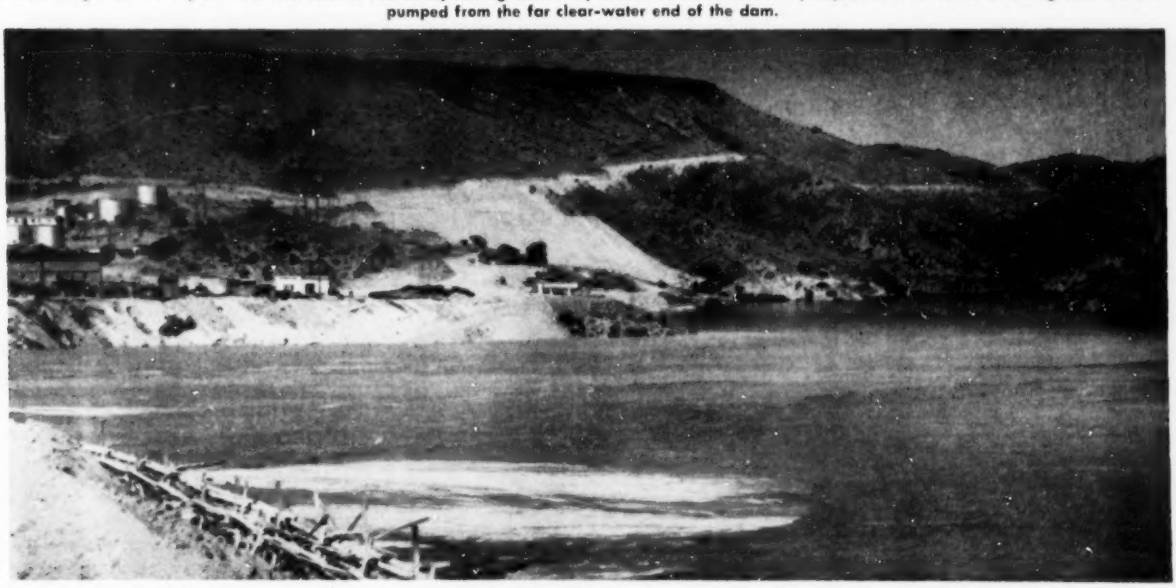


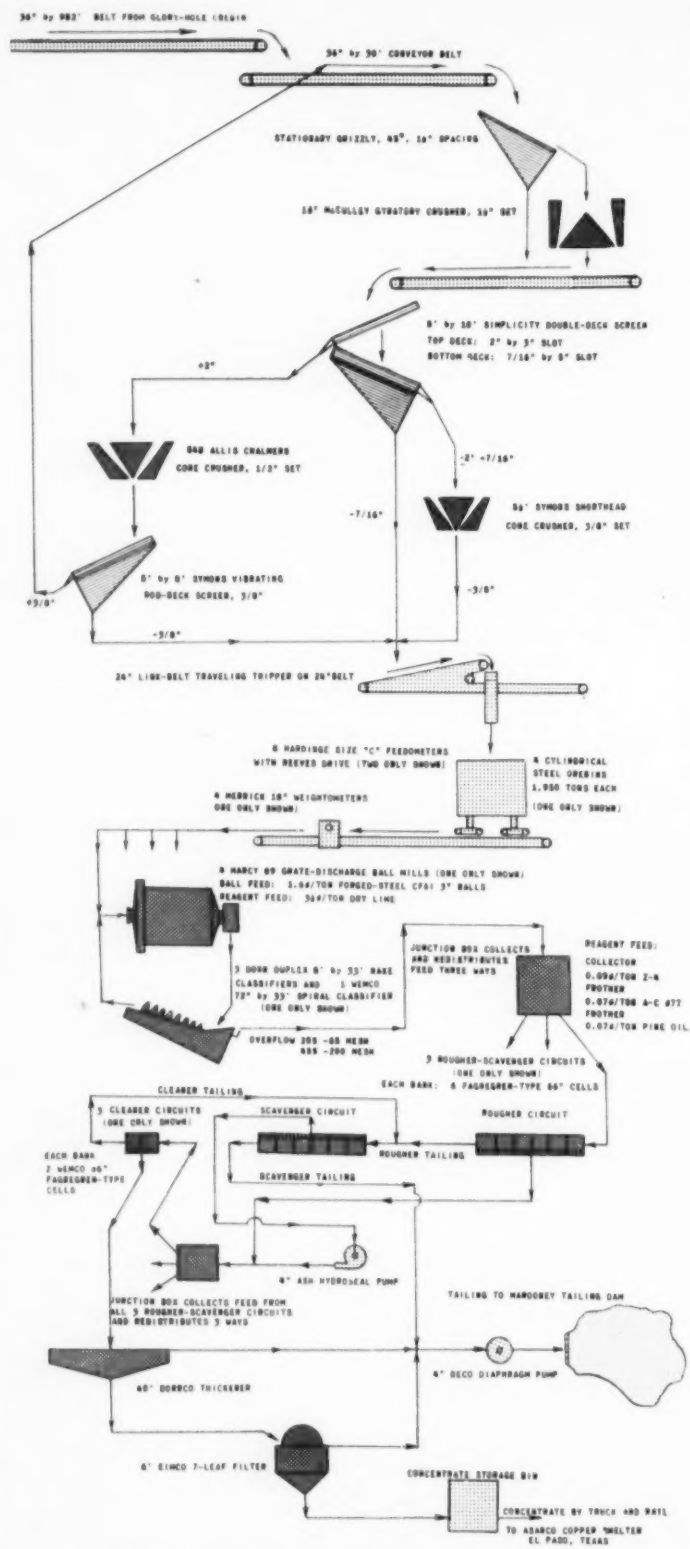
Guest established rigid pH control: Through a system of hourly checks, operators determine the pH of the classifier overflow and the rougher tail every hour. Coupled with pH control is density control by means of Massco-Adams density controllers in each classifier circuit. With a regulated density, and a measured pH, operators soon learn just how to regulate lime feed to the ball mills in order to adjust the pH to 11.5 (in actual practice, it varies between 11.0 and 12.0) Another important point in the pH control is that lime, the controlling reagent, is fed to the ball mill, the earliest possible point in the circuit.

Crush and Screen

The crushing circuit is one designed for production of a minimum

Mill tailing flows to a point near the face of Marooney tailing dam. Any excess of fresh water is pumped into the dam. Returning mill water is pumped from the far clear-water end of the dam.





BAGDAD MILL FLOWSHEET

of fines, and a resulting efficiency of grinding and reagent consumption. The system consists simply of crushing, screening to produce three products, and crushing of the coarser two products to the desired minus-$\frac{3}{8}$-inch size (see cut of flowsheet). The finely crushed ore collects on a 24-inch conveyor belt which carries it to a Link-Belt traveling tripper which dumps it to any of four 1,950-ton orebins.

Feed from each orebin is closely controlled by means of two Hardinge Feedometers (belt feeders) which are controlled by Reeves variable-speed drives. Under each ore bin, a cross belt carries the ore past a Model S Weightometer, and delivers it to the ball mill with which the ore bin is matched. Operators check the Weightometer and adjust the Feedometer so that each ball mill receives feed at the proper rate.

Coarse Grind Means Economy

An interesting feature of Bagdad's grinding is the coarseness of the product. All four Marcy 89 mills are grate-discharge mills which allow for free overflow after a minimum of grinding. Fine grinding is not necessary because, as mill superintendent George Green says "our ore does not require it." It does not contain a large quantity of the barren iron pyrite which forces most porphyry-copper mills to grind their ore much finer." A side effect of coarse grinding is unusually low ball consumption. Bagdad uses three-inch forged steel CF&I balls at the unusually low rate of 1.6 pounds per ton.

The four Marcy 89 ball mills discharge into a common junction box prior to rougher flotation. This mixing (also used between the rougher-scavenger and cleaner circuits) of feed from four mills is another means of stabilizing pH because it blends four streams which may vary in density and pH.

All reagents, except the conditioning lime, are fed to the junction box prior to rougher flotation. The rougher circuit is divided into three parallel banks, each bank of which consists of six 66-inch Fagergren flotation cells. In each circuit, the rougher tailing then passes on to a bank of six 66-inch Fagergren cells which are used as scavengers, and which serve the purpose of extracting the last trace of sulphide copper from the product. Tailing from the scavenger circuit is pumped by a four-inch Deco diaphragm pump to the Marooney tailing dam.

Tailing Dam Stores Water

The Marooney dam serves several purposes: First, it eliminates the

Al Smith, mill foreman, has worked at Bagdad since the middle 1930's and is credited with solving the water supply problem.

LEFT TO RIGHT: general superintendent J. H. Cazier, treasurer and general manager E. R. Dickie, and chief electrician W. D. "Pop" Deacon are having a round-table discussion of an electrical problem. The big shovels, crusher plant, and flotation mill are electrically powered.

need for thickening tailing in order to conserve water. Second, it provides ample capacity for fresh-water storage; water arrives at Bagdad from Burro creek, nine miles away. It is collected from a pool at Burro creek, pumped by two parallel pumps through a 10-inch line to a second tank at Boulder creek. After storage there, it is pumped by two parallel pumps through another 10-inch line to Bagdad. Any surplus water (over and above the daily requirements) is pumped into Marooney tailing dam, stored there until needed, and then pumped for mill use only. Third, it dissolves and stores acid-soluble leachable copper which may be recovered at some later date.

The water supply at Bagdad (in very dry country) is a problem, and mill superintendent George Green gives full credit for water conservation to foreman Al Smith: "Al has done a wonderful job of keeping the mill going on a fresh-water supply of only one gallon per minute for each 10 tons of ore milled daily."

Rougher tailing and scavenger concentrate from each of the three banks are fed to one junction box which again mixes and thus equalizes the feed to cleaner flotation in three banks of two 56-inch Fagergren cells. Cleaner tail is sent to the scavenger circuit. Cleaner concentrate is sent to a 40-foot Dorrco thickener, and the thickened concentrate is then filtered by an Eimco seven-leaf by six-foot disc filter. The filtered concentrate falls to a storage bin from which it is trucked to the railroad siding at Hillside, and then goes to the American Smelting & Refining Company copper smelter at El Paso, Texas. The final concentrate contains approximately 31.28 percent copper, a very rich concentrate for 0.89-percent ore.

Table No. 1
Reagent Use at Bagdad Copper Company

Reagent	*Used As*	*Pounds Per Ton Ore*	*Point of Addition*
Dry Lime	pH Control	3.5	Ball Mill
Sodium Xantate	Collector	0.09	Junction Box*
* After grinding.			
Pine Oil	Frother	0.07	Junction Box*
A-C #77	Frother	0.07	Junction Box*

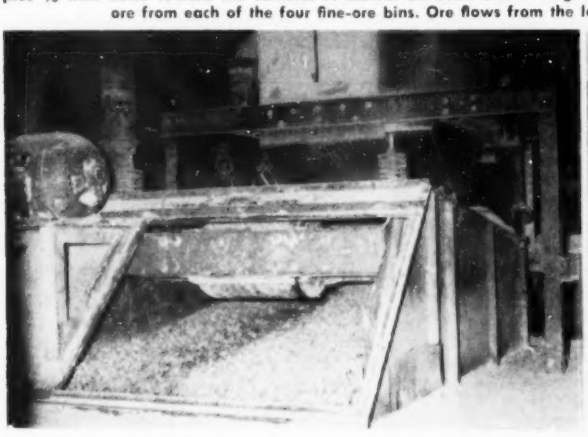
Plans for Expansion

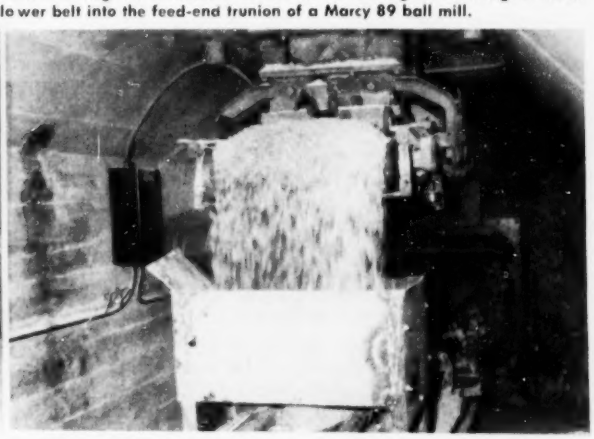
Bagdad has installed a system of molybdenum recovery. It consists of rougher flotation of the copper-molybdenum product from the 40-foot Dorroco thickener. Nokes' reagent (half sodium hydroxide and half phosphorous pentasulphide) is used to depress the copper. Thickener underflow passes to a rougher circuit of six 44-inch Fagergren cells; the rougher tailing (copper concentrate) goes to a thickener, a filter, and to sale. The molybdenite rougher concentrate is reground in a small 24-inch mill. The concentrate is then cleaned in six stages in Denver "Sub-A" No. 8 and No. 12 cells. Production of molybdenite (MoS_2) concentrate since July 1, 1951 has been 1,800 pounds. The concentrate assays 92.0 percent MoS_2, 1.0 percent copper, and 2.0 percent insoluble.

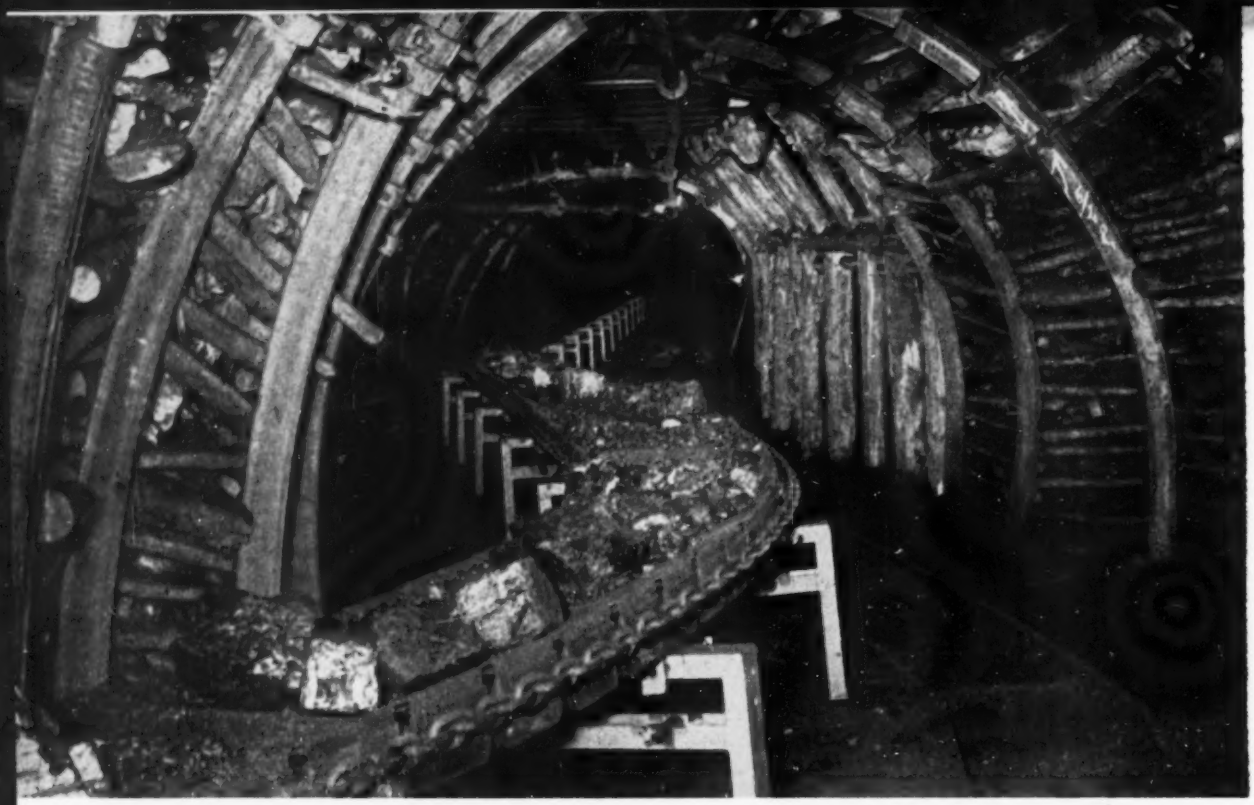
Big Plans Ahead

With its mine and mill humming like a top, and with large reserves of ore, Bagdad is making plans to raise production to 9,000 tons daily, and to install a plant for concentrate roasting, acid production, calcine leaching, precipitation, and electrolysis. It's a big move—one which would make Bagdad one of the major copper producers of the United States.

LEFT: The two screens of this double-deck Simplicity screen slant in opposite directions. Plus-2-inch ore blows away from the camera and plus-$\frac{3}{8}$-inch flows toward the camera. A blower exhausts dust through the covering hood. RIGHT: Two of these Hardinge Feedoweights meter ore from each of the four fine-ore bins. Ore flows from the lower belt into the feed-end trunion of a Marcy 89 ball mill.







The conveyor carries a load around an S curve. The empty return section goes through an adjoining mine working.

TURNING-DIPPING-TIPPING CONVEYOR

German "Kurvenband" mine conveyor transports loads in two directions at same time around curves up and down slopes and turns over for discharging.

The successful use of the "Kurvenband Hemscheidt Grebe" at the German coal mine, Friedrich der groze, has attracted the attention of mining men everywhere. The conveyor does so many things under difficult underground conditions that a description and pictures of its operation are presented here to show what can be done with this new conveyor.—Ed.

The "Hemcheidt" conveyor can be considered as a chain-driven conveyor with concave-shaped platforms, or troughs, moving over a metal framework and guided by channel-shaped iron rails.

The new conveyor system can be arranged to transport materials upward and downward at an angle as great as 30°, around curves, and to tip to any degree so that discharge can be segregated for size at different points. It can convey material in two directions at the same time, and can simultaneously convey supplies to the working face while transporting ore from the same face. The conveyor can be turned over at any point, for cleaning or other purposes, and any combination of over-under, side-ways, or upside down sections can be utilized to take maximum advantage of minimum working room.

The 600-millimeter-wide conveyor transports 150 to 180 tons of coal per hour at a speed of one meter per second. Where space is limited, it is possible to use a 400-millimeter-wide conveyor with the returning troughs at right angles and alongside the loaded conveyor.

Figure 1 shows the location of the rails, the seat of the troughs on their ball bearings, and the arm on each side of which the drive chains are connected. In addition to the central guiding bearing, each trough has three supporting roller bearings, alternately two on one side and one on the opposite side. The conveyor turns (in horizontal plane) by means of a fork and pin center arrangement shown in figure 2. Each trough is connected to two adjoining troughs so as to form a continuous unit. Turning is made possible by the alternating of the supporting roller bearings, i. e., two and then one on each side.

Driven On Either Side

With a drive link chain on each side, power is supplied by either or both chains simultaneously without interfering with the movements of the conveyor. This drive system is necessary for turning curves where the stretched outer chain exerts the pulling power and the slack inner chain hangs loose between the troughs.

The power drive link chains of the conveyor are round steel links 16 millimeters in diameter. The links

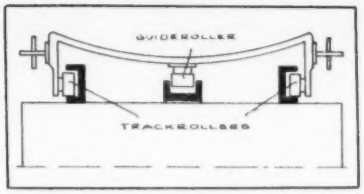


Figure 1. Cross section of the conveyor showing the center guide bearing and the supporting roller bearings.

are fastened to each trough by special eyes or loops. Once the chain links (three to each trough) are joined, the two extreme ends are placed with their security plates in the sliding slots of the overlapping ends of the platform plates and held in position by nuts.

Between and underneath the troughs are special pockets in which strips of rubber are fitted that bridge the slit between the troughs no matter what their relative position to one another may be. These rubber strips are 7 millimeters thick, 125 wide and 600 long. Wear and tear has not been great because foreign material introduced between the trough and the rubber escapes through slots in the pocket.

Rolls On Ball Bearings

The use and application of the ball bearings, 3,600 for every 100 meters of conveyor, has been the subject of much study. As the position of the ball bearings is not stationary and they must operate in dusty and dirty conditions, a special bearing has been developed. This bearing has an outer diameter of 60 millimeters with 14 millimeter balls set inside the bearing race with a 0.5 millimeter clearance. This clearance, combined with the funnel-shaped opening in the bearing case, makes the bearings virtually immune to damage by dirt and dust. During trials, the ball bearings have been subjected to adverse operating conditions designed to wreck the bearings. Fine coke, ashes, iron filings, flint, and other abrasive materials have been introduced. No bearing seized under the tests which were run with and without oil. After many months of operation, there was no appreciable wear on the rolling surfaces. The bearing, in effect, cleans itself by throwing out any dirt which enters the ball race. Although it has been proven by trials that the bearings can run without oil, increased efficiency and lower power consumption are attained by its use. Because the ball bearings must all pass the same point at a specific interval, a special oiling system has been developed. At any given time interval (once a shift), the bearings are oiled by a fine spray of oil under pressure from a fixed atomizer. This spray has a cleaning as well as a lubricating effect.

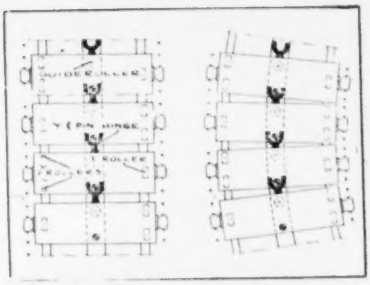
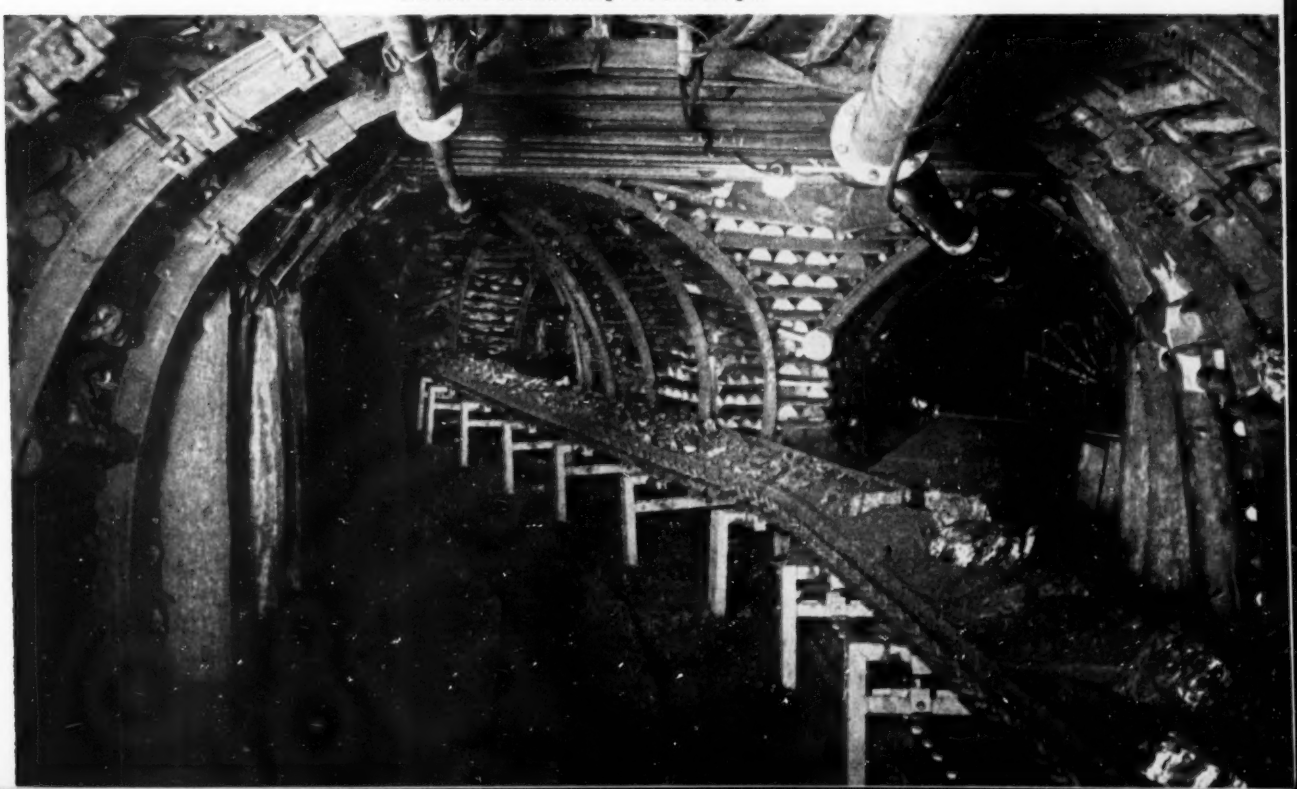


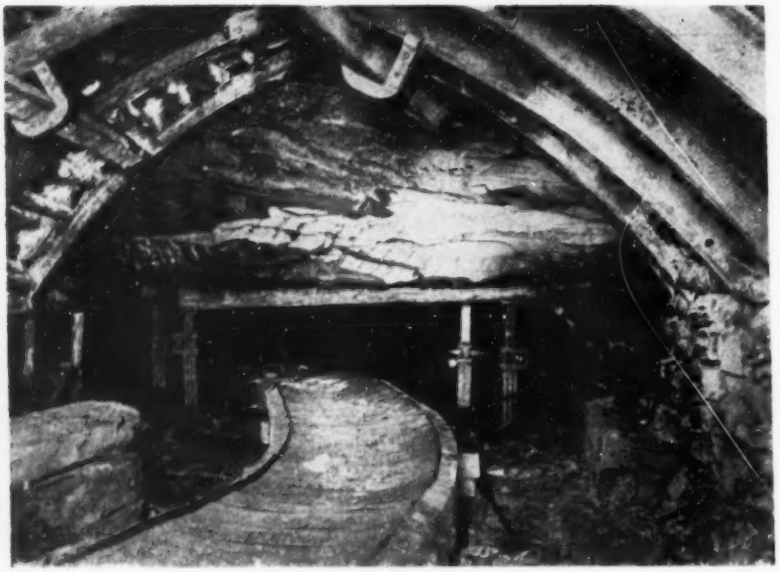
Figure 2. Plan view of a section of straight and curved conveyor. Note the fork and pin arrangement on each trough and the position of the roller bearings.

Air or Electric Motor Drive

Four, 20-hp., compressed air motors were used to drive the 650-meter-long conveyor. Air pressure was between 60 and 75 pounds per square inch. Each of the motors, or all of them, can be started or stopped from different points. Electric motors can easily be used in place of air motors. The motors, which can be placed on either side of the conveyor, drive a shaft which powers a continuous transmission chain with a series of teeth which engage the links of the drive chains. The transmission chains are held in position by hardened guide strips on

The loaded conveyor carries its load out of the drift on the left. The inbound empty conveyor is underneath the loaded section in the foreground and then is directed through the drift at right.





Bend near the loading end of the conveyor. Note the metal guard plates covering the power-drive link chains on each side.

which the transmission chain rollers run. The reversible drive shaft has a device by which the drive chain can be tightened or slackened. With the same power supply, the conveyor can be driven with the troughs upward or downward.

A complete motor-transmission chain unit has the same length (three meters) as a regular unit of the conveyor so that it can be installed at any place in the conveyor. In long conveyors and for those which elevate material a great distance several power units are necessary and should be installed to afford an equal driving force to the conveyor.

Bend To Fit Curves

The conveyor is supported by a steel framework holding the channel-shaped directional channel rails. The rails between supports are three meters long for straight runs and 1.5 meters for curves. The rails are bent to fit the curve desired. However, the maximum radius of curvature should be less than six meters.

Vertical metal fins can be installed on the troughs at varying intervals as necessary to prevent slippage or shifting of the load while being transported up or down grades as steep as 30°.

Operating Results

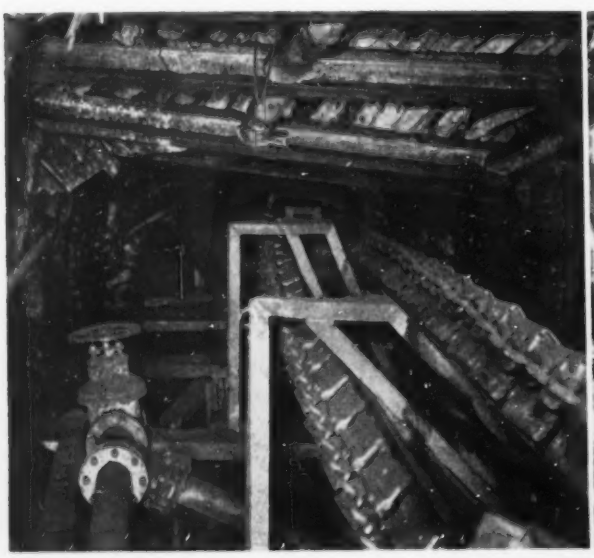
After five months of uninterrupted testing service operating results of the conveyor have been considered entirely satisfactory. During the test, the conveyor was subjected to all kind of operating conditions: level, upward, downward, around many curves, and with the empty returning troughs upside down and at right angles to the loaded section.

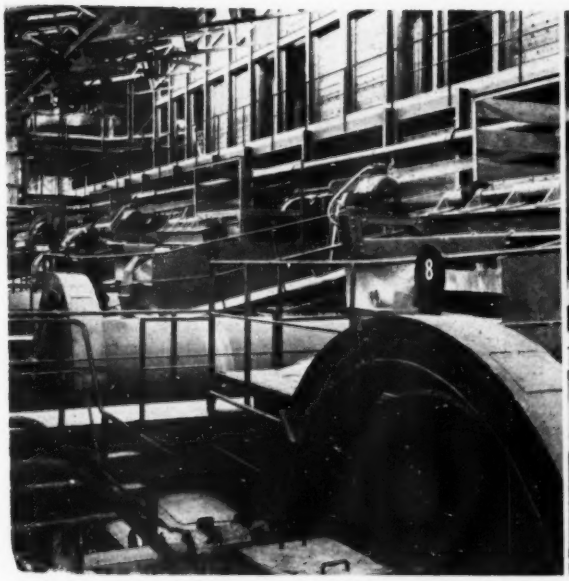
The greatest wear took place on the rails at the curves and it was necessary to reinforce them. The guiding and supporting ball bearings, as well as the rubber strips between the troughs, showed little wear. During the test period, the conveyor was installed and operated to convey material in one direction only.

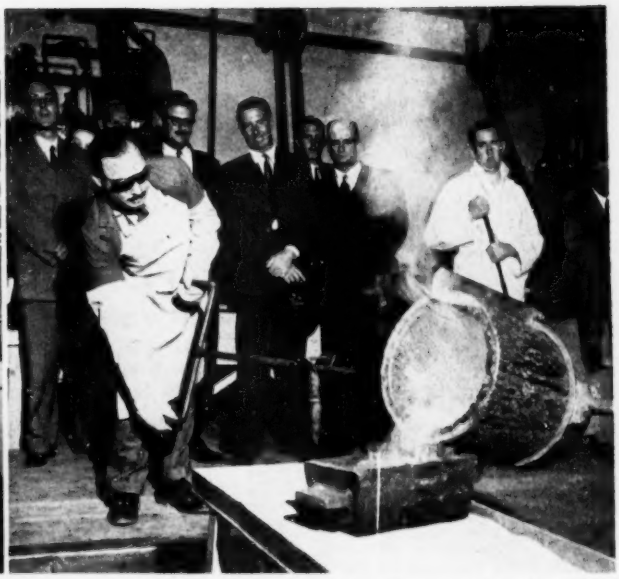
The rubber strips proved entirely satisfactory as a tight joint even when the conveyor was bending and tipping sideways for dumping. The conveyor has a segregation action. That is the finer-sized particles settle to the bottom of the trough. Water sprays were used at the discharge end to prevent dust.

The use of the conveyor with many bends obviated several shorter straight-line flights and had the additional advantage of no transfer points. This meant less dust, less wear and tear, and, in the case of coal, less breakage.

LEFT: The conveyor turns completely over to discharge its load into a transfer raise. The direction of flight is toward the point where the picture was taken. RIGHT: Air motor (left) and driving unit of the conveyor. Electric motors can also be used as a power source and would make a more compact driving unit.







LEFT: Part of the grinding section of the Welkom gold mill is shown here. The mill is equipped with 12 pebble mills arranged for three-stage grinding. Feed to the primary mills is minus-½-inch. The ground pulp from the third grinding is 75 percent minus-200-mesh. The grinding circuit at Welkom is much different than that at the nearby St. Helena mill described in the January 1952 issue of *Mining World*. RIGHT: M. F. Oppenheimer, chairman of the Welkom Gold Mining Company, Ltd., pours the first gold bar of about 1,000 ounces at the Welkom mill. It was the second Orange Free State mill placed in operation. Witnessing the pouring are the managers of other Free State mines and governmental engineers.

SIR ERNEST OPPENHEIMER STARTS WELKOM GOLD MILL, FORESEES £100,000,000 ANNUAL OUTPUT

The cyanide mill of the Welkom Gold Mining Company, Ltd., Welkom, Orange Free State, Union of South Africa was officially placed in operation by Sir Ernest Oppenheimer, chairman of the Anglo American Corporation of South Africa, Ltd. at a special ceremony on November 24, 1951.

During the ceremony, he said that he looked forward to a very bright future for the Free State gold field and that in a very few years the annual production would be valued between £75,000,000 and £100,000,000 with the result that currency of the Union of South Africa would be as "hard" as that of the United States. The benefits of the gold field will not only be to the Orange Free State province but to South Africa as a whole.

Reporting on the history of the area, he said that in 1932 and 1933 the New Consolidated Gold Fields Ltd. initiated a bold and scientific prospecting campaign which proved a considerable extension of the West Rand. This achievement heralded a new era of prospecting for gold. Early in 1933, Anglo American started a drilling campaign in the Klerksdorp district which disclosed highly payable reefs within the upper Witwatersrand strata in the area where the Western Reefs Exploration and Development Company, Ltd's. mine has since been developed. From there, the Corporation looked for extensions and went to the Orange Free State.

Before pouring the first bar of gold, H. F. Oppenheimer, chairman of the Welkom Gold Mining Company, said that this was the beginning stage of one of the greatest developments South Africa had ever seen.

The mine surface plant, mill, and in the background the native compound of the Welkom Gold Mining Company, Ltd., Welkom, Orange Free State, Union of South Africa. This aerial photograph was taken in July 1951 by Max Holsinger of *Mining World* during his African tour.

Hugh Leach, superintendent, Cleveland-Cliffs Iron Company, Marble, Minnesota, is the newly elected chairman of the Minnesota section of AIME. He presided at one of the symposium's technical sessions.

minnesota MINING MEN MEET

The annual AIME-University of Minnesota meeting at Duluth highlighted recent progress on the Iron Ranges

When iron miners of the Lake Superior district get together, the meetings are unique. They are vastly different from the general conventions held in other mining sections. This difference stems from the fact that there is little diversity of interest, and every person in attendance is deeply concerned with every item on the agenda. This is, of course, because the problems of the region, while vitally important, are relatively few in number, they are of recent origin and nearly every operator started seeking their solutions at about the same time.

Record Attendance

This was much in evidence at the meetings of the Minnesota Chapter AIME and the annual Mining Symposium sponsored by the University of Minnesota at Duluth in mid-January. An exceptionally fine three-day program drew an all time record attendance.

Drilling Session Popular

Drilling, one of the two taconite production problems still to be solved, was the subject of one of the most popular sessions. Ingersoll Rand's Quarrymaster, Linde Air Products jet piercing and Joy Manufacturing's rotary blast-hole drilling machine were described by technicians of the manufacturing companies. It was obvious that as the drilling of taconite becomes more economical, other segments of the mining and quarrying industry are being benefited by increased drilling speeds and lowered costs.

Jet Piercing Reported

Jet piercing was discussed in a progress report prepared by R. B. Aitchison, D. H. Fleming and J. J. Calaman, all development engineers of Linde Air Products. It was delivered by Mr. Calaman. In the past year, according to the report, which dealt only with drilling of taconite, the equipment and technique of operating it has been materially improved. Reduced fuel and maintenance costs, increased drilling speed and safer operating conditions have resulted. In 1951, holes 7½ inches and larger in diameter were drilled at greater speeds and at less cost than were 6" holes during the previous year.

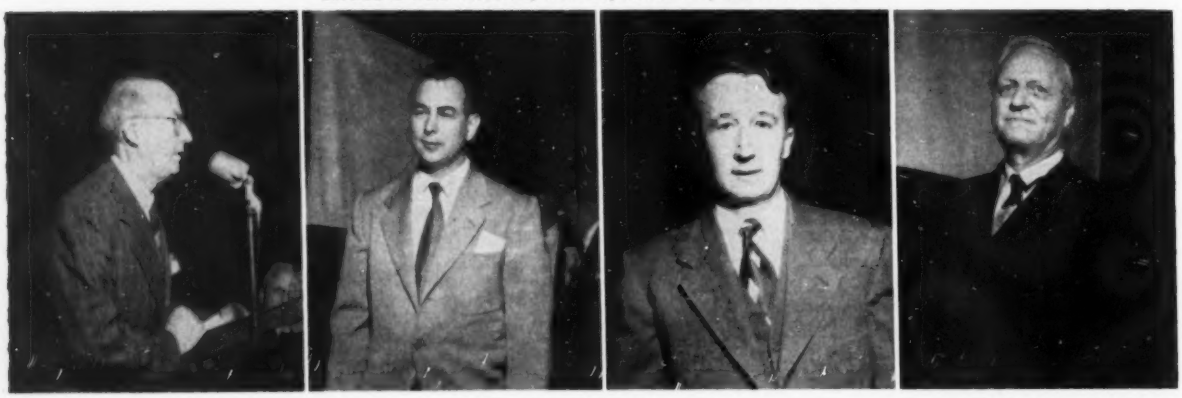
Quarrymaster Applications

The discussion of Quarrymaster operation by J. A. Wiendl, special representative, Ingersoll-Rand Company, was not confined to the use of the equipment on taconite or iron ores. However, performance data given for the percussion drilling unit and its carbide insert bit seemed to indicate that certain applications of the machine to hard taconites may be practicable.

Rotary Drilling Progress

Although the equipment has no present application to the problems of the Range, Samuel Leven, chief engineer, Joy Manufacturing Company, captured the fancy of the crowd with a discussion of rotary drilling in limestone and other materials of medium hardness. With Joy equipment, smooth-walled, uniform-diameter blast holes have been drilled at exceptional speeds and to extreme depths. Mr. Leven stated that the only bar to the use of rotary equipment for drilling taconite was that presently known materials and methods of applying

LEFT TO RIGHT: E. J. Duggan, Climax Uranium Company, Grand Junction, Colorado, described tailing disposal and water recovery in the high mountains and severe weather at Climax, Colorado. R. W. Bell, assistant superintendent, Erie Mining Company, Aurora, Minnesota, augmented the jet piercing paper by discussing certain phases from the field management standpoint. Z. W. Thomas, Union Construction and Dredging Company, St. Paul, Minnesota, was engineer on the Rabbit Lake dredging operation. His illustrated description of the methods employed was well received. J. Wilbur Van Evera, consulting mining engineer, Crosby, Minnesota, presided at the opening session of the symposium which was devoted to water resources, their use, distribution, and conservation.



them have not produced a bit that will stand up under the severe conditions presented.

Several Promising New Devices

Heating screens to prevent sticky materials from blinding the screen cloth was described in a paper delivered by Masao Tanamachi and co-authored by Stephen E. Erickson, both beneficiation engineers, M. A. Hanna Company. An electric current of 7 volts and 2,700 amperes was passed through the cloth on a double deck Tyler vibrating screen to heat the upper screen to 180 degrees and the lower cloth to 75 degrees. Used in the experiment was a special stainless steel, Ty-Rock screen with copper strips crimped along each of two edges. It was insulated from the frame with micarta and held by copper bus bars which replaced the tensioning bars.

Material did not build up on the warm wires, and the results were no blinding, greater screen capacity and more uniform sizing.

Other new equipment and developments discussed at the meetings included: The cyclone as a deslimer by William Van Slyke, beneficiation engineer, Cleveland-Cliffs Iron Company; the wobbly feeder by Marvin Johnson, Oliver Iron Mining Division of United States Steel Company and Ronald B. Pearson, assistant chief engineer, Cleveland-Cliffs; the turned over conveyor belt by D. Kelly Campbell, project engineer, Cleveland-Cliffs; and the Dutch State Mines cyclone as a separatory vessel and other devices by Stephen Erickson.

Advance Planning on Water

Water supplies, distribution of available water and conservation measures occupied a large place on the program for the second consecutive year. The availability of water was discussed by S. A. Frellsen, Minnesota Department of Conservation, and P. R. Speer and Robert Schneider, both of the U. S. Geological Survey. E. J. Duggan, mill superintendent, Climax Uranium Company, told about tailings disposal and water recovery while J. R. Hoffert, Department of Health, Commonwealth of Pennsylvania, spoke on pollution.

Lighter aspects of the program proved as interesting and entertaining as the more technical sessions. These included moving pictures of Steep Rock Ore operation shown by M. A. Fatheringham, president and general manager of that company, and Labrador iron mining operations shown by Morris Bradley, director of public relations and Earl Hummer, executive consultant, M. A. Hanna Company.

Bomi Hills Deposit

The ore deposit at Bomi Hills, new Liberian high grade iron ore development, was described in a slide-illustrated talk by E. F. Fitzhugh, Jr., chief geologist, Republic Steel. It was revealed that the known extent of these deposits is considerably greater than generally has been supposed.

How Algoma Ore Properties switched from open pit to underground caving of extremely large blocks of iron ore at its Helen mine, a subject of ever increasing interest in the Lake Superior District, was described by Harold Scott, Mine Superintendent.

LEFT: William Van Slyke, beneficiation engineer, Cleveland-Cliffs Iron Company, described his company's experience with the use of a cyclone for desliming. CENTER: Morris Bradley, public relations director, and Earl E. Hunner, executive consultant, both of the M. A. Hanna Company, presented a color motion picture of the company's operations in Labrador. RIGHT: D. Kelly Campbell, project engineer, Cleveland-Cliffs Iron Company, Ishpeming, Michigan, told about the "Turned Over Conveyor Belt" as employed underground in the Mather mine.

LEFT: R. B. Aitchison, and J. J. Calaman, development engineers, Linde Air Products Company, authored a paper covering the latest developments and progress in jet piercing blast holes. CENTER: Ronald B. Pearson, assistant chief engineer, Cleveland-Cliffs Iron Company, Taconite, Minnesota, was co-author of a paper on the wobbly feeder. The paper was delivered by Marvin Johnson, mine superintendent, Oliver Iron Mining Division of the United States Steel Company. RIGHT: Harold Scott, mine superintendent, Algoma Ore Properties, Sault Ste. Marie, Ontario, reviews with Fred D. Hoover, general mining captain, Oliver Iron Mining Division of the United States Steel Company, a paper he delivered on underground mining at the Helen Mine. Mr. Hoover led the discussion period on this paper.

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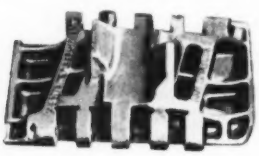

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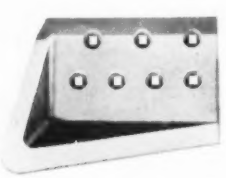

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An adit was driven on the vein during 1951. The portal and the vein outcrop are plainly shown in this photograph.

NATIVE BISMUTH, INC. STARTED DEVELOPMENT WORK AT CHARLEY CREEK, ALASKA DURING 1951

During 1951 considerable development work was done on the Charley Creek, Alaska, bismuth prospect described in the June 1951 issue of *Mining World*. At the time the article was written, the men engaged in the enterprise were acting in partnership; however, since then, the group has incorporated under the name of Native Bismuth, Inc., to facilitate development of the project. O. A. Margraf is president of the company and also manager of the operation; David Russell is vice president; O. E. Margraf is secretary, as well as mining engineer on the project during this past summer's season; Hilkey Robinson is treasurer.

The property, known as the Charley Creek Bismuth Prospect, consists of six lode claims and five placer claims, which are located on Charley Creek approximately 35 miles north of Nome. A fair tractor trail has been made to the mine from the end of the nearest highway. This highway starts in Nome, is 25 miles in length, and ends approximately 12 miles from the mine.

1951 Activities

During the 1951 season, equipment and supplies had to be moved to the property from the end of the highway where they had been stored the previous season. After the tractor trail had been brought in to shape, these materials were speedily hauled in and a comfortable camp established near the vein system. With the camp set up, work started immediately on exploring the veins. The creek was dammed and diverted away from the exposed veins in the creek bank. An adit was then started along the strike of the vein. At the same time, the bulldozer was used to put in cross-cut trenches on the hillside. In all, 13 trenches were made; in 12 of these, the vein was uncovered; in the 13th cut, there was too much overburden and although considerable bismuth-bearing float was bulldozed up, the bedrock was not reached. By freeze-up time, the adit had been driven 54 feet, 13 trenches were made, the property had been mapped, and a considerable number of samples had been taken.

Geological Findings

From evidence uncovered during this summer's exploration program, it was found that the bismuth occurs as native bismuth and bismuthinite (Bi_2S_3) in a siliceous gangue material. Disseminated bismuth was also found in the schists surrounding the veins. The quartz vein matter where exposed was indicative of the filled or fissure-type vein. Characteristically, it was frozen to one or both walls. An occasional horse of country rock was seen. Replacement of the schist by quartz was noted as a subordinate depositional feature. The silica possesses well-formed crystals surrounding drusy cavities.

No pattern of mineralization is apparent—the bismuth minerals are disseminated throughout the quartz and schist with no obvious preference toward deposition in a particular zone. High grade specimens show successive generations of metallization—re-fracturing providing openings of late deposition.

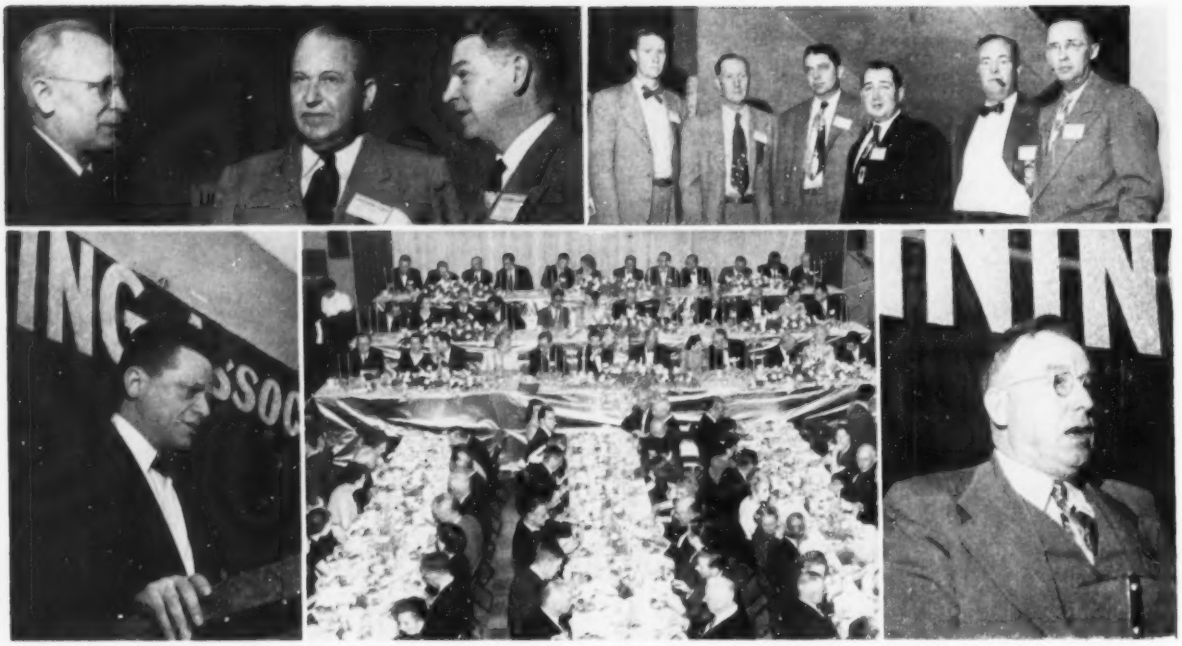
Aid From Alaska Mines Dept.

Mapping of the property, running of assays for bismuth, gold and silver, as well as other technical services, were accomplished in cooperation with Nome Field Station and Assay Office, Department of Mines, under the direction of Daniel A. Jones, Associate Mining Engineer. The Department of Mines is a Territorial agency with headquarters in Juneau, Alaska, under the supervision of Commissioner Leo H. Saarela.

At various times during the 1951 season, the property was visited by interested individuals. Among those examining the operation were J. A. Herdlick and Robert Thorne, both of the U. S. Bureau of Mines, Region 1; also Max White, Alaska Section, United States Geology Survey, Washington, D.C.; and J. D. Crawford, Fairbanks, Alaska, manager of the United States Smelting Refining and Mining Company.

Program For 1952 Season

Plans for the 1952 season are to continue the adit to a length of at least 500 feet, with at least two 40-foot crosscuts from the adit. While this work is going on, channel cuts every five feet along the adit will be taken and assayed. On the most promising ore shoot, it is planned to sink approximately 200 feet. By the end of the season, exploratory work should be completed and from that work future possibilities of the mine can by then be laid out.



Top Row LEFT: Congressman Ken Regan (center), chairman of the United States House of Representative's Committee on Mines and Mining, attended the Colorado Mining Association's convention to get a first hand report on mining. James Bean (left), of the American Cyanamid Company, New York, and William L. Jude (right), superintendent of New Jersey Zinc Company's Empire Zinc Division, Gilman, Colorado, advise him about industry developments. RIGHT: Speakers at the "Small Miners Section" included (from left to right) Harrison S. Cobb, Boulder County, Colorado, tungsten producer; Walter E. Burlson, Chaffee County, lead-zinc miner; D. V. Watrous, Clear Creek and Gilpin County, lead-zinc operator; Tom E. Martin, Summit County, mine owner; Henry P. Ehrlinger, session chairman and prominent San Juan engineer and mine operator; and Ray A. Bennett, uranium producer.

Bottom Row LEFT: Hon. Robert R. Rose, Assistant Secretary of the Interior in charge of minerals, addresses the Colorado Mining Association's 55th annual convention. He came west for his first chance to meet and talk to miners from all parts of the United States. CENTER: The Gold and Silver Banquet once again lived up to its reputation as the mining world's most beautiful banquet. Shown here is the head table and a small part of the crowd. RIGHT: Andrew R. Sims, assistant general superintendent, Anaconda Copper Mining Company, Butte, Montana, reviewed the expansions in mine development now under way in the Butte mines.

MINING PLANS FOR 1952 DRAFTED AT COLORADO CONVENTION BY INDUSTRY-GOVERNMENT LEADERS

"Metals are essential for national defense" was the message given to more than 2,000 miners as they registered for the 55th Annual Convention of the Colorado Mining Association. When the convention closed in Denver, three days later, on February 2nd, there was a unanimity of agreement between the industry and government as to plans and policies for the increased domestic production of metals during 1952.

Hon. Robert R. Rose, Assistant Secretary of the Interior, in charge of minerals, reported: "The success or failure of the entire defense program is dependent on the mineral industry—this is the first time I have had the opportunity to meet with the nation's miners—the industry and government must adopt and pursue a stimulated exploration program."

Jess Larson, administrator of the Defense Materials Procurement Agency, outlined the DMPA belief in a "strong domestic mining industry" and would do all possible to support it on a sound program. For those metals where the Defense Production Administration says a deficit exists, the DMPA will negotiate government assistance contracts with mine owners for each project to speed production to overcome such deficiencies, Larson added.

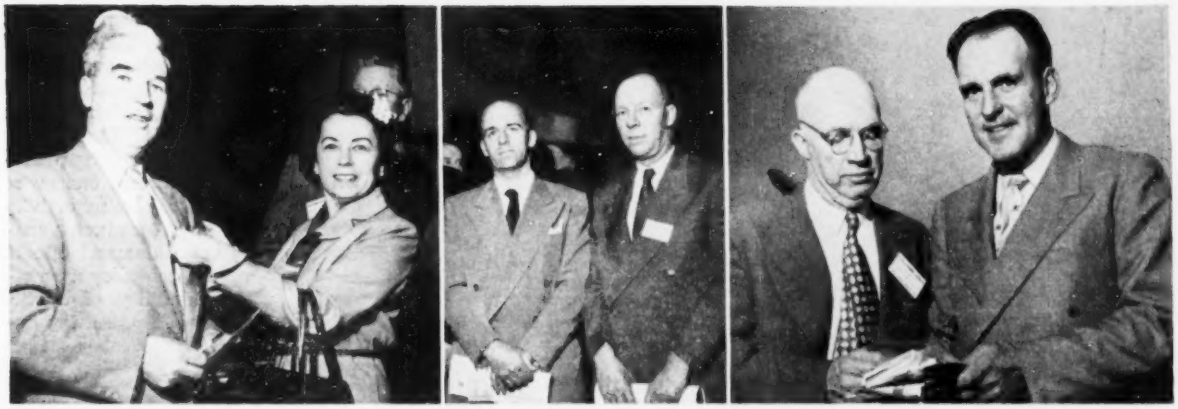
Exploration to Development

Under existing regulations of DMPA, when the Defense Minerals Exploration Administration certifies a successful exploration project and shows that an ore deposit or reserve exists which would justify commercial production, the DMPA will negotiate terms necessary to assure production was Larson's report. Howard I. Young, deputy administrator of the DMPA, next told the miners that no worthy mining projects would be held up and that success of the entire program was dependent on cooperation by the miners.

Industry Plans

Executives from the nation's mining companies outlined in great detail the steps they and their companies were taking to cooperate with governmental agencies. They also announced mineral policies and mining expansion methods and plans at a special session held during the second day of the convention.

C. O. Anderson, vice president of the Ozark-Mahoning Company, reviewed the fluorspar industry in 1951 and speculated as to what might



LEFT: Viola R. MacMillan, president of the Prospectors and Developers Association, Toronto, Canada, pins a registration badge on her engineer-geologist husband. CENTER: Norman D. Ebbley (left) and Tom Skidmore (right) Skidmore Mining Company, Dove Creek, Colorado were two of the more than 300 uranium miners at the Convention, Ebbley reported on an engineering study which indicated the need for greater care and accuracy in sampling uranium ores. RIGHT: Mike Cloonan (left), Ozark-Mahoning Mining Company, Cowdrey, Colorado, and Ray Sullivan (right), Minerals Engineering Company, Grand Junction, Colorado, were session chairmen at the convention.

happen in the future. Consumption of fluorspar in 1951 was at an all-time high of about 494,000 tons. Notable increases in consumption by the steel and aluminum industries reflect the great use. Domestic mine production was about 344,400 tons in 1951. Accelerated demands for acid-grade fluorspar resulted in a 20 to 30 percent increase in the price for concentrates; this, plus a relaxing of specifications, gave great impetus to western mining. In Colorado, Reynolds Mining Company and Ozark-Mahoning Company, are expanding mining and milling operations.

Chino Waste Dump Leaching

W. H. Goodrich, general manager, Chino Mines Division of Kennecott Copper Corporation, Hurley, New Mexico, described the development of copper recovery by leaching of waste dumps and outlined current practices. He said that this operation "is a major step in the conservation and utilization of natural resources in the United States—and that it is important that we all do everything possible to make those materials we all have available stretch just as far as they will possibly go."

No Shortage of Iron Ore

R. W. Whitney, general manager of Minnesota mines of the M. A. Hanna Company, Hibbing, Minnesota, reviewed the Lake Superior iron ore reserves and outlined foreign sources of ore. He reaffirmed the production potentials of the iron ore producers and saw no cause for alarm about insufficiency of iron ore for the rapidly expanding steel industry.

Human Engineering

Through a well-designed program to insure efficient utilization of labor, the New Park Mining Company in 1951 shipped the greatest tonnage of ore in history, increased tons of ore per man-shift by nine percent and did 33 percent more development work than in the best previous year. This was the report of Clark L. Wilson, superintendent of the company's mines at Keetley, Utah. The key steps of the company's program are adequate communication between all groups of labor and management, delegation of responsibility with commensurate authority, an active safety program, and personal gain as a work incentive.

Major Developments in Butte

Andrew R. Sims, assistant general superintendent, Anaconda Copper Mining Company, outlined the aggressive steps Anaconda is taking to increase copper, zinc, and manganese output in Butte. Old mines are being reopened and new mines developed. The difficulties and costs of opening old mines were outlined; however, in several areas of Butte important zinc ore reserves were being developed in old mines and previously undeveloped areas. Anaconda's engineering, geology and mining departments were pooling their long experience to develop and produce more ore, Sims said.

Temporary Copper Shortage

Simon D. Strauss, vice president, American Smelting & Refining Company, New York, New York outlined the confusion created in the minds of copper users by the widely varying and contradictory statements about copper made by high administration spokesmen.

He then warned that any consumer of copper who is permanently changing to an inferior material will regret it.

While copper will continue in short supply for some months, Strauss saw an increase in availability because of the following factors: 1) Foreign currency exchange difficulties will channel more copper into dollar market; 2) Freer scrap movement; 3) An increase in United States price to world copper price of 27.5 cents per pound would bring an increase of 50,000 to 100,000 tons per year from domestic mines; and 4) Increased production in 1952 from the Greater Butte project (Montana), Chuquicamata sulphide plant (Chile), Nchanga (Northern Rhodesia), and Mt. Isa (Australia).

Finest Uranium Session

The annual uranium section of the convention was again of key interest to uranium miners assembled from Colorado, Utah, Arizona, and for the first time—New Mexico.

In the past year, the producing area of the Colorado Plateau uranium district has been greatly extended to the southwest and new discoveries are being made almost daily. The rapidly expanding scale of mining and processing was outlined by Frank H. MacPherson, manager, Colorado Raw Materials, Office of the U. S. Atomic Energy Commission. In four years, the number of processing plants has increased from two to eight and two more plants will probably be built in the next year. Both will be in New Mexico—one near Grants, and the other at Shiprock.

The record-breaking production of ore in 1951 was stimulated by higher prices paid for by the AEC; a new, graduated bonus for initiai ore production from new and certain existing mines; and the purchasing of copper-bearing uranium

TOP LEFT: The Hon. Homer E. Capehart, United State Senator from Indiana (left) was the featured speaker at the Sowbelly Dinner. He is the ranking minority party member of the U. S. Senate Banking and Currency Committee. At the (right) is Colorado's Governor Dan Thornton. The Senator told the nation's mining men that "we ought to return to the gold and silver standard." TOP RIGHT: Simon D. Strauss, vice president, American Smelting and Refining Company, New York, New York, told the group that metal shortages are not permanent and that any manufacturer permanently substituting an inferior product for copper would regret it. BOTTOM LEFT: Richard W. Whitney, general manager of Minnesota mines of the M. A. Hanna Company, assured the adequacy of iron ore for the expanding steel industry and outlined domestic and foreign mine expansion programs. BOTTOM RIGHT: The session on Minerals Policies and Mining Expansion featured outstanding speakers from all parts of the United States. C. O. Anderson, vice president of the Ozark-Mahoning Company, Tulsa, Oklahoma, is speaking on "Fluorspar, A Vital Defense Mineral." Other speakers included, from left to right: Andrew R. Sims, assistant general superintendent, Anaconda Copper Mining Company, Butte, Montana; Percy S. Gardner, Calumet and Hecla Consolidated Copper Company, Calumet, Michigan; Richard W. Whitney, general manager, Minnesota mines of the M. A. Hanna Company, Hibbing, Minnesota; and Clark L. Wilson, superintendent, New Park Mining Company, Keetley, Utah.

ores at Monticello and Marysvale, Utah, MacPherson said.

Greatest Prospecting Program

Thomas W. Oster, chief, Grand Junction exploration branch, U. S. Atomic Energy Commission, told the largest audience ever assembled at a uranium session, "I think it is safe to say that never in the history of the world has organized prospecting and exploration been carried out on such a large scale." This intense search is continually expanding the known geographical area where uranium is found as well as determining that uranium occurs in a very wide range of geologic horizons. Several years ago it was thought to occur in only three.

Importance of Radioactivity

The consistent physical characteristic of radioactivity has been the most important and effective ore-binding factor. Instruments and techniques for logging radioactivity have made possible the discovery of many orebodies. This has been particularly true for airborne radioactive surveying techniques. Oster reported there are still many facts about uranium that remain unknown. They include: where did the uranium come from; structural control, if any, of the orebodies; the effects of ground-water; and what all the uranium minerals are.

Exploration by subsurface logging of drill holes and airborne radioactive surveying has been of great importance. However, the "secret weapon" has been a full-blooded Navajo Indian. Last year, Indians employed by the AEC discovered 16 unknown uranium deposits and four of these have developed into producing mines.

Industry's Activity in Uranium

Walter E. Remmers, president of the United States Vanadium Company, the largest mining and producing company, spoke on the activities of his company. He reported that, in addition to operating its own mines, USV has about 50 agreements with lessees on its own properties and buys ore from about 90 independent miners. The USV is presently doubling the capacity of its Uravan, Colorado plant and will begin the processing of high lime carnatite ores in 1952. There is no question about the increasing peacetime demands for atomic energy so that a long period of mining activity is apparent. The by-product, vanadium, is in greater demand due to scarcity of other ferro-alloying metals and the availability of ductile vanadium metal with promising expanding future markets.

AEC Bonus Depletable

Robert S. Palmer, executive director of the Colorado Mining Association, reported on the work done by the Association and the Independent Uranium Vanadium Producers Association in having the Treasury Department issue regulations concerning uranium and vanadium. Vanadium and uranium are eligible for 15 percent depletion allowance the same as other metals, and depletion on the $10,000 AEC bonus is on a per unit base up to 10,000 pounds. This is the same in principle as World War II Premium Price Plan bonus payments; therefore, the gross income from the first 10,000 pounds of U_3O_8 is depletable as for a new mine.

Soda Ash from Trona

C. A. Romano, resident manager of the recently formed Intermountain Chemical Corporation, reported on "Trona in Southwestern Wyoming." He outlined the trona discovery and subsequent test drilling of a 30-square-mile area in Sweetwater County, Wyoming, to develop an estimated 250,000 tons of trona in a mineable bed, (10 to 20 feet thick) at a depth of 1,600 feet. Mining and processing of the trona have been underway on a pilot plant scale since 1947. Successful development of a process to produce refined soda ash from the trona has been completed and a $20,000,000 expansion program is now underway. A new production shaft is being sunk and a large plant is under construction. Full scale operations are scheduled for early 1953. About 2,500 tons of trona will be mined and processed daily.

The Metals Future

The final paper at the convention was a fitting summary of "The Metal Situation" presented by Otto Herres, vice president, Combined Metals Reduction Company, Salt Lake City, Utah. He outlined the progress made by the mining industry despite limitations and controls im-

posed by government regulations. As to increasing production he said, "Obviously additional production can come only from new properties or marginal ore made commercial by higher prices." For the future, he added, "The industry can go far toward overcoming existing shortages of metals and minerals and providing adequate production for future needs if assured of constructive treatment of its tax problems and afforded at least the same consideration and advantages given by our government to foreign properties."

Scientific Tailing Disposal

A progress report on "Disposal of Flotation Tailing" by the Idarado Mining Company, Ouray County, Colorado was read by R. W. Unger, Idarado's mill superintendent. Idarado has used five tailing sites in the last seven years and in 1951 started storing of tailing on a 75-acre site. The entire area is underlain with alluvium of unknown depth. After removing all top soil and vegetation, sub-soil drainage was provided by reinforced concrete pipe lines inside and parallel to the dam with laterals at 100-foot intervals extending 100 feet into the pond area.

As a long range study of tailing disposal which would be of great interest to the entire industry, Unger recommended the following: "To develop tailing disposal into a science, we should be able to establish standards based, possibly, on sizing analyses for predetermining (1) minimum pool area required for settling and clear effluent; (2) minimum total area to properly handle vertical water permeability and stability which would in turn indicate sub-sail requirements; (3) safe maximum heights and slopes of faces; and (4) economical methods of distribution and berm construction.

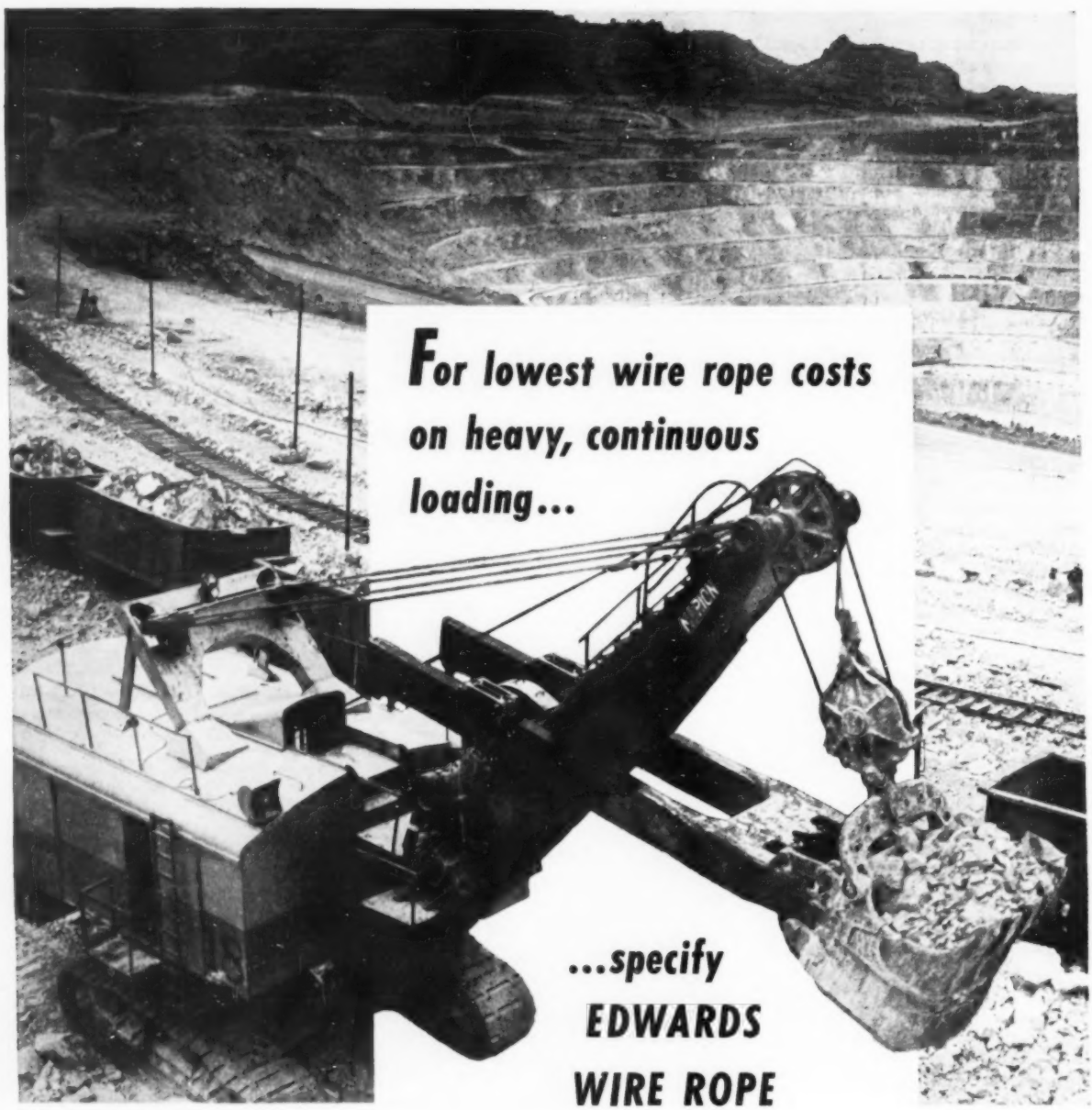
All Officers Reelected

At the final session of the convention Blair Burwell, president, Minerals Engineering Company was elected president; J. Paul Harrison, manager, Colorado operations American Smelting and Refining Company first vice president; Harrison S. Cobb, manager, Cobb and Weldon, second vice president; Charles A. Chase, executive vice president Shenandoah Dives Mining Company, third vice president; H. S. Worcester, manager King Lease, Inc. fourth vice president; E. D. Dickerman, fifth vice president; H. W. C. Prommel, treasurer; and Robert S. Palmer, western consultant to the Defense Materials Procurement Agency, executive director.

ABOVE: Colorado mining companies have long set the standard for efficient tailing pond operations. Why and how stream clarification is achieved was outlined by this panel of experts, LEFT TO RIGHT: Brymer Williams, Department of Chemical and Metallurgical Engineering, University of Michigan; C. J. Abrams, general manager of operations, Climax Molybdenum Company; Donald A. Dahlstrom, Northwestern University; Cloyd A. Snaveley, Battelle Memorial Institute; William F. McGlone, Colorado Stream Clarification Committee; and R. W. Unger, Idarado Mining Company.

ABOVE LEFT: W. H. Goodrich, general manager, Chino Mines Division, Kennecott Copper Company, Hurley, New Mexico, outlined copper recovery by "Waste Dump Leaching at Chino Mines Division." ABOVE CENTER: W. H. Marquette, Wyoming Gulf Sulphur Company, Cody, Wyoming reported on his company's new sulfur flotation mill and invited the members of the industry to visit the plant and see how sulfur is mined and milled. ABOVE RIGHT: R. W. Unger, mill superintendent, Idarado Mining Company, Ouray, Colorado, described a long-range study of tailing disposal, so important to the mining industry.

ABOVE LEFT: C. A. Romano, resident manager of the newly formed Intermountain Chemical Corporation, reported on "Trona in Southwestern Wyoming." ABOVE RIGHT: Percy S. Gardner, Jr. outlined the development of hydraulic hoisting at Calumet and Hecla Consolidated Copper Company's Shullsburg, Wisconsin zinc mine. BELOW LEFT: Thomas C. King, mining engineer, Frost Airborne Survey Corporation of Baxter Springs, Kansas described open pit developments in the Tri-State. BELOW RIGHT: Sam Akeeha, chief of the Navajo Indian Tribal Council, Window Rock, Arizona told of Navajo activities in uranium production.



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LEFT: The winter snow pack in the mountainous chrome-producing areas of Northern California and Oregon has temporarily halted shipments of strategic chrome to the ore purchasing depot at Grants Pass, Oregon. The Strategic Minerals Corporation mill near Galice, Josephine County, Oregon, concentrates ore trucked from the nearby Sordy mine. **RIGHT:** Many producers have built concentrators to process crude chrome ore and take advantage of the more favorable price for high-grade concentrates at the government's Grants Pass purchasing depot in Oregon. The G.M.C. Mining and Milling Company mill shown here is 1½ miles west of Eagle Point, Jackson County, Oregon.

GRANTS PASS CHROME DEPOT

The long battle for a sensible program of domestic chrome stockpiling has been successfully concluded by producers in Oregon and California

By F. W. Libbey, Director

Oregon State Department of Geology and Mineral Industries

Ever since the end of World War II, people familiar with the strategic minerals situation in the United States, and especially those who had experience in strategic minerals procurement during the war, have been pointing out to the federal authorities the hazard of relying on foreign sources of chrome, as well as other war minerals, and the need to encourage domestic production. It was first urged upon the government stockpiling agency that encouragement be given to potential producers of chrome in southern Oregon and northern California by offering contracts which would allow profitable operation and the building up of our stockpile. It was continually pointed out that an incentive price was essential. Domestic producers could not compete with foreign producers of chrome because of low wages in foreign lands and high operating costs in this country. It was emphasized again and again that chrome mines could not be turned on like a spigot and that these mines were in a different class from those of copper, lead and zinc, in which reserves are developed before production can be had. Where, chrome miners asked, would the country get its chrome if it should come to a showdown with Russia and submarine warfare should be even partially successful? No interest was shown and no action was taken by stockpile authorities. The weak reason was given that domestic producers could not supply an acceptable grade and that the stockpiling agency owned unusable chrome purchased domestically during World War II.

Korea Limelights Chromite

The start of the Korean war brought the strategic minerals situation and the lack of a domestic program into the limelight and Congress demanded action. The Defense Production Act of 1950 was passed and the long, uphill fight to implement the Act in order to get some tangible results was begun. At that time Mr. S. H. Williston was appointed an administrator of one of the divisions of the bureau organized under Dr. James Boyd, who had been appointed Defense Minerals Administrator. For several years Mr. Williston had been trying to get government attention directed to the strategic minerals situation and particularly the need for incentive payments in order to obtain domestic production of chrome. His first activities in the D.M.A. pointed directly to setting up a government chrome-buying program as the quickest way to insure that a sudden war emergency would not catch us with an inadequate stockpile and no chrome mining industry.

Advisory Committee Organized

In the meantime a field advisory chrome committee was organized consisting of Dorothea Moroney, Niel R. Allen, F. I. Bristol, W. S. Robertson, and Ray Helmke. After several meetings locally the committee, at the request of D.M.A. but paying its own expenses, conferred with D.M.A. officials in Washington, D.C. Several conferences were held in attempting to

The chrome producers shipping ore and concentrates to the Grants Pass, Oregon, ore purchasing depot are largely small-mine operators. Under the impetus of a clarified purchasing program, however, both their size and number have increased to the point where Grants Pass purchases have become a significant percentage of government stockpiles.

arrive at a satisfactory price. Some government people were pessimistic concerning the ability of Oregon and California to produce any significant amount of metallurgical grade chrome and they gave lukewarm backing to the committee in its efforts to get a fair price. Finally through the work of Mr. Williston and Mr. James Douglas the General Services Administration was authorized to set up an ore purchasing depot at Grants Pass with definite specifications for ore to be purchased. The main points of the specifications were, as given out by government officials at a meeting in Grants Pass sponsored by the Oregon Mining Association, that the price for standard 48 percent Cr_2O_3 with a 3 to 1 chrome-iron ratio ore would be $115 per long ton ($110 for concentrates), with bonuses and penalties for above and below grade with a minimum grade of 42 percent Cr_2O_3 and 2 to 1 chrome-iron ratio. A curious specification was inserted that a maximum of 2000 tons per producer per year would be all that the government would buy. This was the only maximum specification first given out, and a good reason for it was not made clear.

Grants Pass Depot Opened

The depot was finally opened on August 3, 1951. Establishment of the depot resulted in a large amount of prospecting and mining activity in Oregon and California. Chromite began to come in to the depot even before sampling equipment was installed and before the people in charge of the depot were ready to receive the ore. At first there was dissatisfaction over methods of sampling and results of analyses. This dissatisfaction caused a slight reduction in mining activity but it was overcome when the necessary changes were made in sampling procedures. Since that time in early September no general dissatisfaction has been reported.

A reorganization of the Defense Minerals Administration took place in the summer of 1951 and the Defense Materials Procurement Agency, supposedly an agency which would have over-all power to set up and administer ore purchasing programs, was established. This new agency issued a new release on the chrome program which contained a new specification that the maximum amount of ore that would be purchased would be 200,000 tons over a period of from 3 to 5 years. The new specification caused some concern among producers in that any substantial capital expenditure by a producer would perhaps not be warranted in that the program could very well be terminated before this expenditure could be repaid. Another Oregon Mining Association meeting was held in Grants Pass and the Oregon chrome committee asked Mr. Bristol to discuss the matter with government officials in Los Angeles at the annual convention of the American Mining Congress in September. At this convention he received some encouragement that the chrome miners' petition for relief would receive consideration. In order to follow up these assurances, Mr. Bristol made another trip to Washington and had another round of conferences with agency heads and congressmen. On his return to Grants Pass, the chrome committee issued a formal statement which, in effect, stated that results of Bristol's conferences were as follows:

(1) Agreement that the United States needs high grade domestic chrome.

(2) That steps would be taken immediately to earmark enough money to take care of production above the 200,000 ton limit.

(3) Contracts would be given for more than 2000 tons production per year per operator.

(4) Contracts will be negotiated on the West Coast.

(5) Delivery may be accepted at other points than Grants Pass if real need is shown.

(6) The report by Bristol would be checked so as to verify the need for the increase in the program.

It would appear that the important results of Mr. Bristol's visit were (1) to obtain assurances that the government people finally realize the need for domestic production of chrome, and (2) that contracts could be obtained from the Emergency Procurement Service, Washington, D.C.

Government Contracts Successful

It is interesting to note that government contracts are now found to be the best way to obtain production. As mentioned above, contracts were strongly urged on the government stockpiling agency several years ago as the best way to keep alive the nucleus of a chrome mining industry.

It is reported that one contract has already been negotiated and that it is outside of the 200,000 ton maximum to which the stockpile is limited. Probably some contracts will be deducted from the 200,000 ton figure. In any event, it is stated that the buying program will definitely close at the end of three years, although the program's formal starting time is not known to the writer. Perhaps it dates from January 1, 1952. It appears that some contracts will be for three years and not a part of the 200,000 ton maximum, while other contracts may extend a full five years and be deducted from the 200,000 ton figure.

The high activity among chrome producers has come to a standstill (January 1952) because of snow in the mountains but when weather conditions permit, an increased rate of production over that shown in

Continued on Page 97

Muriel Sibell Wolle Describes

CAPITOL CITY ROSE'S CABIN

Tucked away in a most inaccessible part of the great San Juan mountains, 9,500 feet above sea level, is all that remains of a mining camp that once aspired to be the capitol of Colorado. Rumor states that the new camp was first called Galena but that its name was soon changed to Capitol City, and rumor also states that it lost its bid for the capitol to Denver by two votes! Had it won, it is hard to visualize where it would have put a big city, for the meadow where it stands is not wide and is surrounded by high, snowcapped peaks-Sunshine, Capitol, Garbutt, Littlejohn, Majestic and Empire.

The townsite, which was laid out in the spring of 1877, covered 200 acres and in no time had enough cabins and population to warrant its description as a "lively little city." It was incorporated the same year and was served by a stage line which ran between Lake City, nine miles below at the mouth of Henson Creek and Ouray, 15 miles away on the other side of the mountains.

From 1877 into the eighties 'Cap' City boomed. Its streets were lined with "neat dwellings," falsefronted stores and log cabins. There were several hotels, restaurants and saloons, a meatmarket, run by C. H. Woodbury who advertised "all kinds of Fresh Meats constantly on hand;" a postoffice and before long, a log schoolhouse. This was soon outgrown, and in 1883 a new white frame building, which cost $1,510, was completed and was "accepted by the Directors." Furnishings for it cost $600. But by the time it was ready for use Capitol City's boom was beginning to fade and it was never filled to capacity.

There were plenty of mines. The J. J. Crooke lode near the north fork of Henson Creek showed "some of the handsomest minerals seen in Hinsdale county—green carbonates and gray copper," and the Polar Star, the Great Eastern, the San Bruno, the Excelsior, the Incas, the High Muck-a-Muck and the Yellow Medicine produced pay ore.

As more and more mines were opened up mills and smelters were built. The Henson Creek Reduction Works were a mile above the city and George T. Lee's smelter was situated a mile below on the creek. Lee's saw and planing mill was also at the lower end of town and every Thursday 100 burros, loaded with lumber and shingles picked their way down the trail to Lake City. Near his mill stood the large, two story mansion which he built at great expense and for which he imported bricks, packed in straw, which were estimated to cost him $1.00 apiece. The house eclipsed anything in Capitol and was said to be the best-built dwelling in the San Juan.

The population, which was all prospectors and miners with their families, fluctuated from 100 to 400 and back to 100 again. In 1883 everything was lively and lots of work was being done in the mines. To facilitate freighting the Henson Creek Toll Road, which was spoken of as "one of the best mountain roads in Colorado" was widened so as to be 'double track' as far as 'Cap' City.

During the 90's the population rose to 700. In 1900 the discovery of gold started a new boom and miners swarmed over the mountains, prospecting and reopening old properties. Up to this time the Capitol City district had been regarded as an area yielding only low grade copper and lead ores but developments proved that some veins carried pay values in gold or were high grade in silver.

The Capitol City and Yellow Medicine continued to produce hundreds of thousands of dollars worth of ore. The Capitol City mine alone shipped high grade lead ore for some time, sending 20 tons per week to the smelter. The Yellow Medicine, which was taken over by the Colorado Fuel and Iron Co. and was later leased to Crowe and Fagen, produced large amounts of low grade argentiferous galena ore, which was sent to the Ocean Wave Sampler and then shipped to smelters in Leadville, Denver and Pueblo. During this period the Yellowstone, Galic, Vulcan, Portland and Czar were worked. The Ajax and Moro lodes were developed and produced hundreds of tons of high grade gold and copper ore which was freighted from the mines to the city.

Mine owners and leasees were enthusiastic. "After years of indolence," they announced, "Capitol City is attracting the measure of attention that is its due. We predict that in time 'Cap' City will become one of the famous camps of the Silvery San Juan." But the boom passed and Capitol slipped slowly back to sleep again. And it is still dozing. The schoolhouse, with its peeling blackboards and plaster-

Capitol City, looking up the road to Rose's Cabin, with the schoolhouse in the distance.

cluttered floor stands guard at one end of the town; the Lee mansion—a broken, brick skeleton, looted and defaced by vandals—at the other. Two or three weathered and sagging cabins dot the meadow above which tower the peaks, their sides scarred by snowslides.

Five miles above, on the headwaters of Henson Creek, at an elevation of 11,200 feet, is Rose's Cabin or what is left of it, for half of its roof has caved in and some of its walls sag badly.

The original one story log cabin was built in 1874 by Corydon Rose, one of the early pioneers of the San Juan and was, until 1875, the only place of entertainment on the eastern side of the range until Lake City was reached.

As soon as the stage road from Lake City was extended beyond Capitol City up over Engineer Mountain, Rose's Cabin became a regular stage stop. When prospectors discovered mines in the area it also became the center of a tiny camp whose population fluctuated betwen 50 and 100. A store, a post-office, a restaurant and a few cabins comprised the camp with Rose and his cabin as the center of activity.

The camp was surrounded by many good lodes and some well developed properties; the Highland Chieftain with its peacock copper ore and the Palmetto—both steady producers. In 1878 a second big strike was reported on Copper Hill above the Cabin. Pack trains from Engineer Mountain wound down ledgelike trails from the Palmetto, past its stamp mill and bunk house and past the Hoosier Boy to Merritt's Restaurant, located at Rose's Cabin which advertised:

"Meals, Lodging, Hay & Grain,
Liquors & Cigars
Forwarding to all the Mining Camps
Pack Trains of 60 Animals
A Central point to visit all the mines of the San Juan country."

During the summers large amounts of ore were packed on burros from the mines to Rose's, where that which was to be sent to Crooke's works or to the Ocean Wave Sampler in Lake City was reloaded into wagons and sent down the Henson Creek Toll Road.

In later years the store and restaurant was run by Charley Schafer who also freighted by oxteam between his place and Lake City. His bar ran the full length of the cabin and for years an iron safe, with his name on it in gold letters, stood behind it. Over the bar, tacked on the wall, was a U. S. Revenue Tax receipt, issued in 1878 to Schafer licensing him to sell liquors and cigars. (This could be seen on the wall of the cabin as late as 1920). Upstairs, thin partitions formed 22 bedrooms in which stood old spindle-type bedsteads.

By 1882 Rose's Cabin Hotel and Saloon was advertised as "Miners' Headquarters" by William Raaka, proprietor, who announced that the hotel had been entirely refitted and enlarged and that not only 'good stabling' was available for animals but that 'horses and jacks for public accommodation' were always kept ready for customers. For years the cabin was unoccupied after Colorado went dry; then Golconda Mines Consolidated acquired it to use as headquarters for their operations in the Horseshoe and Hurricane basins. By the 1930's, to the sturdy log building with its square hewn timbers had been added two wings surfaced with composition shingles, and the place was occupied, at least during the summer months. In 1949 it was not only deserted but it was beginning to fall to pieces and when it disappears, a colorful landmark in the San Juan will be gone.

Rights and Responsibilities

Our County Courthouse is built on the side of a little hill alongside our main street. High above the street on a dome is a statue. Like dozens of similar buildings in our country, the statue is that of Justice and her balances. We sometimes think that placing Justice thus high above us is a mistake for we are prone to forget the lesson message that she carries. We feel that our Lady should be placed down by the entrance so that all might touch her robes in passing, and think of the message that she carries in the pans of her balances.

If we should ask a passerby why Justice is blindfolded, he would probably say it was to show that justice must judge without favor between men. In this he would be partly right and greatly wrong. The right answer was given over twenty-five centuries ago when the Finger wrote in letters of fire on the wall of a Babylonian banquet-hall—"TEKEL"—"Thou art weighed in the balances and art found wanting." As a result of that verdict, the King was slain that night. He had claimed every last title of his Rights but had not assumed and carried his Responsibilities to his people. That is the message a Blindfolded Justice presents to us. When we appear at Her Bar, we must come with clean hands. While we claim our Rights, we must show that we have assumed our Responsibilities.

We make no apologies for quoting from the Bible in a working technical journal. Economic law has grown up through past centuries—through the Vedas, the Upanishads, through the writings of Confucious—to its highest development in the Bible. It presents a system of Economic Laws as binding and inexorable as those of the Medes and Persians. If we break those laws, we may seem to succeed, but in the end it is we who will be broken. If we adhere to those economic laws, our chances for success are enlarged when we fully assume our Responsibilities.

Nearly fifty years ago, the truth of the foregoing was indelibly impressed upon us. Two young engineers, one of them our company contract engineer, decided to open a modern coal mine in a dangerous gas district. They were both enthusiasts in safety developments, and did everything possible to make their mine safe. During the first six months of the operation they had to change their safety-lamps four times. The men insisted on their Right to smoke when and where they wished. They did not assume their Responsibility for their fellow workers. The result—43 dead Cherry Creek coal miners. The economic laws must not be broken.

In industry we may say that we are working in copper, or lead, or autos, or other goods, but each of us, both labor and management must realize that we are really dealing in the lives of men. Therefore, when we claim our Rights we must also be prepared to assume our Responsibilities. Failure to do this is the cause of most of our labor troubles and misunderstandings.

It is really too bad that our present trouble with Communism in labor should be hagridden by a spectre from the past. Remnants of youthful enthusiasms still linger in the minds of the older leaders on both sides. Neither side can wholly forget a legacy of hate on one side, and support on the other side for the totally destructive economic doctrines of the I. W. W.

(To be continued)

The Wanderer

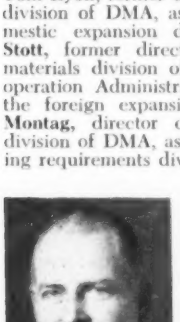
ACTIVITIES OF U. S. MINING MEN

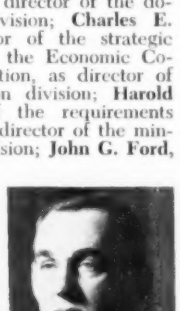
CHESTER H. STEELE, head of the Butte mines geological department of Anaconda Copper Mining Company, has been named general manager of Western mining operations. This includes all company properties at Yerrington, Nevada; Grants, New Mexico; Darwin and Tecopa, California; the Bonanza mine at Colville, Washington; and the phosphate mine at Conda, Idaho. Mr. Steele has been with Anaconda since 1916 when he graduated from the Montana State School of Mines.

Louis Buchman has been elected vice president and director of Kennecott Copper Corporation. Mr. Buchman has been associated with Kennecott interests since 1914. Since October 1, 1949 he has been general manager of Kennecott's Western Mining Divisions.

A. F. Carper has recently resigned from the Tungstar Corporation at Bishop, California and has taken the job of general manager for the California Tungsten Corporation. The latter company has mines in Tulare and San Bernardino counties in California and is planning other work in Nevada.

Jess Larson, administrator of the Defense Materials Procurement Agency, has announced the following appointments: **James Douglas**, former deputy administrator of the Defense Minerals Administration, as assistant deputy administrator; **Tom Lyon**, former director of the supply division of DMA, as director of the domestic expansion division; **Charles E. Stott**, former director of the strategic materials division of the Economic Cooperation Administration, as director of the foreign expansion division; **Harold Montag**, director of the requirements division of DMA, as director of the mining requirements division; **John G. Ford**, former assistant to the assistant administrator of the General Services Administration for Defense Coordination, as acting director of the contract negotiations division; and **A. B. Parson**, former assistant director of the supply division of DMA, as acting director of the program development division. These appointments complete DMPA's organization in so far as the agency's major operations are concerned.





J. DELANO HITCH, formerly vice president in charge of sales of The Dorr Company, Stamford, Connecticut, has been promoted to the position of executive vice president. T. BARTOW FORD, until recently manager of international sales, has succeeded Mr. Hitch and has been elected a director of the company. Mr. Hitch has been with Dorr since 1927, while Mr. Ford joined the organization in 1926. Among their numerous positions with the firm, both have served as the company's far eastern representative with headquarters in Tokyo.

Russell L. Wood is now associated with Mining Research Corporation at Slickrock, Colorado about 25 miles north of Dove Creek, Colorado.

George R. Rogers, geophysical engineer with Phelps Dodge Corporation, has been transferred from Tyrone, New Mexico to Douglas, Arizona.

C. L. Austin has been elected president of Jones & Laughlin Steel Corporation, replacing **Admiral Ben Moreel** who will remain as chairman of the board. Mr. Austin, former executive vice president, joined Jones & Laughlin in March 1942. **A. J. Hazlett**, former vice president of sales, is now executive vice president of distribution; and **John B. Mitchell**, former vice president of operations, is executive vice president of production.

John G. Dean is now a chemical research consultant with headquarters at 8 Beaumont Circle, Tuckahoe, New York. He was formerly with the International Nickel Company in charge of the Industrial Chemicals Section, Development and Research Division.

Charles W. Lee has been appointed vice president of production of the Consolidated Western Steel Division of the United States Steel Company, succeeding **Lloyd Earl** who recently resigned.

Lester S. Harrison was reelected president of Caledonia Silver-Lead Mining Company at the annual meeting in Kellogg, Idaho. **William Penney** will continue to serve the company as vice president, and **Wayne A. Brainard** as secretary-treasurer.

R. T. and **W. J. Walker** of the consulting geologic firm of Walker and Walker are no longer employed by the Ressurrection Mining Company at Leadville, Colorado, according to **Barney Greenlee**, assistant manager. W. J. Walker is now mining lead ore near Ely, Nevada.

J. Donald Rollins has been appointed assistant vice president of engineering of the United States Steel Company. Appointment of **W. W. Deal** as manager of the New York district sales office of the American Steel and Wire division of United States Steel also was announced. **L. L. Anderson** of New York, and **R. W. Drake** of Wilkes-Barre, have been transferred to Philadelphia.

Lindsay M. Kinney has been named general superintendent of operations of Pend Oreille Mines and Metals Company and its subsidiary, Reeves MacDonald Mines, Ltd. Other recent company promotions at Pend Oreille are: **Loren Billings**, mine superintendent; **Craig Cody**, day mine foreman; and **Earl Land**, night mine foreman. **Jason E. Everts**, formerly with the American Smelting & Refining Company at their property in Northport, Washington, has taken a position on the engineering staff.

A. Q. LUNDQUIST (left) has been appointed assistant general superiniendent of Colorado operations for United States Vanadium Company, a division of Union Carbide and Carbon Corporation. J. F. BRENTON has been promoted from plant superintendent of the company's Rifle, Colorado, plant to superintendent of plants for the Colorado area. Mr. Lundquist has been with the company since 1943 and was for some time superintendent of the plant at Uravan, Colorado. He has had considerable experience in the processing of uranium ores. Before joining the company in 1949, Mr. Brenton held technical and supervisory positions in mining and plastics production and has also been active in educational circles in Colorado.

Admiral Ben Moreel, chairman of the board of directors of Jones and Laughlin Steel Corporation, has been chosen as Pittsburgh's "man of the year" by the Pittsburgh Junior Chamber of Commerce.

Clyde E. Osborn, metallurgical engineer, has returned to the United States after a ten month stay in Australia. During his visit he toured the continent and observed metallurgical practices in both metal and non metallic recovery plants. His headquarters are now with the Western Machinery Company in San Francisco.

L. B. Kuhns is replacing **John W. Schreiber** as chief construction engineer of Aluminum Company of America. Mr. Schreiber will serve the company as a special consultant on construction until July 1 when he retires.

James S. Wroth has resigned as executive vice president and director of In-

FRANK McKINLEY assumed the position of plant superintendent for the Jacksonville, Florida, plant of the Humphreys Gold Corporation on February 1, 1952. He resigned as assistant mill superintendent, Bunker Hill & Sullivan Mining and Concentrating Company, to accept the new position. He was employed by Bunker Hill for a number of years, and also has worked for Coeur d'alene Mines Corporation and the American Smelting and Refining Company.

ternational Mining Corporation of New York. Mr. Wroth has been associated with International Mining Corporation since it was organized in 1928.

Harry L. Miller has been appointed general superintendent of the American No. 1 custom mill of the American Zinc, Lead and Smelting Company at Ouray, Colorado, and the Calendonia mine in San Juan County, Colorado. **William C. Klein** has been appointed assistant general superintendent at Ouray.

Louis Ware, president of International Minerals and Chemical Corporation, was featured recently in the Chicago Tribune series of articles on "How Men at the Top Won Their Place."

William H. Newton has been appointed manager, ore beneficiation division, of Jeffrey Manufacturing Company, Columbus, Ohio. This is a new division of the company which will concern itself primarily with the sale of beneficiation equipment to the metal mining industry.

John Charles Kinnear, former vice president of Kennecott Copper Corporation, has been appointed assistant to Defense Mobilizer **Charles E. Wilson** in charge of metals and minerals.

S. Warren Hobbs, Spokane geologist with the United States Geological Survey, has been elected chairman of the geology-geography section of the Northwest Scientific Association to succeed **J. Hoover Mackin** of the University of Washington geology department.

Robert F. Palmer, executive director of the Colorado Mining Association, has been appointed a consultant to the Defense Materials Procurement Agency.

Judd Whitman, recently resigned as engineer for the Pend Oreille Mines and Metals Company, has accepted a position as assistant geologist under **H. F. Mills**, for the American Zinc, Lead and Smelting Company at their properties near Metaline Falls, Washington.

Thaddeus S. Ullmann, assistant export manager of the Eimco Corporation of Salt Lake City, has returned to his New York City headquarters from a western European trip. During his trip Mr. Ullmann visited with Eimco's foreign subsidiaries and agents in all Western European countries, as well as inspected many Eimco machines operating there.

John R. Quayle is now superintendent of the Hiawatha mine of the Iron River Mines, Hanna Iron Ore Company. He was formerly mining captain at the Homer and Wauseca mines. **Walter A. Lundwall** has been advanced from assistant mining captain to the position of assistant superintendent of the Homer and Wauseca mines. **Clyde Hoar** has been promoted to mining captain of the Homer mine; **Glenn Johnson** is now mining captain at the Wauseca mine. **Louis Ponozzo**, shift boss at the Wauseca mine has been transferred to the Homer mine in the same capacity, and **George Gehlhoff** is to be the shift boss at the Wauseca mine.

Raymond E. Zimmerman, one-time professor and chief of Mineral Preparation, at the Pennsylvania State School of Mineral Industries, and a widely known consulting engineer in that field, has recently returned from Turkey. He had been a consultant to the Turkish Government's Eti Bank and to their E.K.I. organization in mineral preparation problems dealing with copper, chromium,

FORBES K. WILSON has been appointed manager of mineral exploration for Freeport Sulphur Company. A graduate of Yale in mining engineering, Mr. Wilson was associated with Braden Copper Company and later managed several gold mines in Colombia before joining the Freeport organization in 1942. Between 1943 and 1947, Mr. Wilson served as administrative manager and later as assistant general manager at the company's Cuban subsidiary, Nicaro Nickel Company.

sulphur, lignite, and coal deposits. He has accepted the position of chief preparation engineer for the United States Steel Corporation with headquarters at Pittsburgh, Pennsylvania.

S. S. Huyett has been transferred from Empire Zinc Company's Hanover plant to the company's plant at Palmerton, Pennsylvania, as general superintendent. Replacing him at Hanover will be **W. T. Pittijohn**, now assistant superintendent of the company's operations at Austinville, Virginia.

Harmon E. Keyes, Phoenix, Arizona, has accepted the appointment as consultant for Cyprus Mines Corporation. He plans to make arrangements for starting up the company's new autoxidation acid plant which was designed in accordance with the process set up at the City of Phoenix water and sewage disposal plants. The process was originally developed by Keyes.

Edwin B. Eckel of Denver, Colorado, geological survey geologist, has gone to Asuncion, Paraguay on a six months' Point Four assignment. He will make a reconnaissance survey of geologic and mineral resources of Paraguay in cooperation with geologists of the Paraguayan Government to determine which mineral deposits would justify detailed investigations and development.

William J. Kaiser has retired as general superintendent in the Oliver Iron Mining Company's eastern district. For the last few years, this has included the Vermillion Range which was formerly a separate district. Mr. Kaiser had been employed by Oliver for 45 years, having joined the organization as a foreman in the Hibbing district. He was made assistant superintendent at the Wanless mine near Buhl, in 1918, and assistant general superintendent in 1937. He succeeded **W. F. Pellenz** as general superintendent in 1945.

Walter H. Wiewel has been appointed assistant administrator of the National Production Authority in charge of the Metals and Minerals Bureau. He succeeds **Norman K. Foy** who resigned at the end of his term to return to the Republic Steel Company, and **S. B. Coolidge**, former deputy administrator of the Bureau for about six weeks. Mr. Coolidge has returned to the Sherwin-Williams Company. Mr. Wiewel is on leave from his post as vice president of sales for Crucible Steel Company of America.

Robert Webber of Silverton, Colorado has been examining tungsten prospects in Nevada.

Oscar E. Margraf, mining engineer and secretary of the Native Bismuth, Inc. of Nome, Alaska, returned to the United States after the winter freeze-up. He is now employed by the U. S. Bureau of Mines in North Carolina.

Edward C. Leonard has been appointed safety director for the Inland Steel Company mining operations in Michigan and Minnesota. His headquarters will be at the company's office in Ishpeming, Michigan.

ALBERT F. WOLBERT

Albert Foster Wolbert, a Bradley Mining Co. superintendent, passed away from a heart attack at the age of 57. He was at his home at the Sulphur Bank Mine, near Clearlake Oaks, California, when death came on January 4, 1952. His many friends and associates are finding it hard to believe that stout, jovial, popular "Al" Wolbert has departed from their midst.

Al was born in Baltimore, Maryland, on June 16, 1894, the only child of an Army officer father. Al and his mother followed the father on his tours of duty, which included a stay in Honolulu. After his return to the mainland, Al enrolled at the St. Matthews Academy, south of San Francisco. He excelled in athletics at the Academy, and graduated in 1913. Al then went to work for the California Ore Testing Company in San Francisco, and continued with that firm until 1915. In the latter year he was transferred to the Atolia Mining Company as assistant superintendent of their tungsten mine in San Bernardino county, California.

Army service in World War I interrupted Al's career in 1918, but four years later he returned to Atolia as general superintendent. In 1923 he started open pit work in Atolia's famous "spud patch," the deposit of coarse placer scheelite. In 1927 Al was again transferred, this time to the Sulphur Bank quicksilver property in Lake county, California.

Sulphur Bank was where he finally settled down, and where he finished out his life's work. The early years there were arduous, including the breaking-in of a new quicksilver plant, the trial and eventual abandonment of a flotation plant, and the expansion of open-pit mining with its waste disposal problems. These problems swelled with the increased development and production pace demanded by the World War II period. The proportion of overburden to ore often reached a ratio of 80 to 1. Al's celebrated "know-how" in the open-pit field was augmented by tours of inspection to the Mesabi Range and other pertinent focal points.

These hurried years were followed by more quiet times, during which Al was able to buy his home on Clear Lake, and tend his beloved hot-house and garden. He also had time to intensify his community efforts, including a closely-contested but unsuccessful bid for a County Supervisorial post. And there was a good deal of rental of mine equipment for building roads, clearing land, and well drilling in the adjacent farming areas.

The year 1951 was a very rough one for Al, physically and emotionally. In the spring he and Mrs. Wolbert were both hospitalized with severe heart attacks. Grace succumbed to a second attack, and Al was never the same after that. Another blow came during the summer, when his father passed away.

Al is survived by a son, Alton, now living in Stockton, California, and by Mrs. Patricia Tremper of Clearlake Oaks, California.

—WORTHEN BRADLEY

ACTIVITIES OF INTERNATIONAL MINING MEN

ROGER V. PIERCE, consulting engineer of Salt Lake City, Utah, specializing in mining mechanization and general production problems, is now with Cerro de Pasco Corporation in Peru. Mr. Pierce had recently returned from the Minas de Matahambre at Pinar del Rio, Cuba.

Harry Hey, managing director, Electrolytic Zinc Company of Australia Ltd., has joined the council of the Institute of Public Affairs, Victoria.

B. Franklin Wallace, formerly with the South American Development Company in Pirtobelo, Ecuador, is now with the Gold Placer Operation in Quito.

George R. Fisher, general manager of operation of The Zinc Corporation, Ltd., has accepted the position of vice-chairman of Mt. Isa Mines Ltd., Queensland, Australia.

Cyril Ainsworth, a member of the President's Conference on Industrial Safety and technical director of the American Standards Association, spoke for the International Labor Organization at a seminar on industrial safety held in India in February.

Klem B. Gross, assistant general manager, Mt. Isa Mines Ltd., Queensland, Australia has been on a business visit to the United States and Great Britain.

Irving L. Barker has been appointed superintendent of smelting and refining of the Cerro de Pasco Corporation at La Oroya, Peru. He has been with the corporation since 1934 and previous to that date had spent five years at Chuquicamata, Chile.

Sarit Pattajoti, head of the topographic and reproduction section of Thailand's Royal Irrigation Department, and a graduate of Assumption College, Bangkok, has been assigned to Geological Survey in Washington on a Mutual Security Agency grant to obtain working experience in his field. Four other technicians from Thailand, all staff members of the Thai Geological Survey and graduates of Chulalongkorn University, will go to the University of New Mexico, Albuquerque, for academic work under MSA grants. They are: **Ambhai Anubuyong** of Bangkok, assistant chemist; **Payome Aranyakanon**, Bangkok, assistant geologist in charge of the petrographic laboratory; **Pumwarn Komalarjun**, Bangkapi, acting assistant chief of the lignite prospecting unit, and **Kasetre Phitaksphraivan**, Bangkok, assistant geologist in charge of the museum section.

Harvey Mudd, president of the Cyprus Mines Corporation, has sailed from the United States for an extensive African trip. While in Africa he will visit the four large Rhodesian copper mines. He will also make an inspection of Cyprus Mines Corporation's mining and metallurgical installation on the island of Cyprus.

P. L. Clark, formerly manager at Highland-Bell Ltd., has been appointed manager of Sunshine Lardeau Mines Ltd., at Camborne, British Columbia, Canada. The mill at Camborne, acquired from Dentonia Mines, Ltd., has been revamped to meet Sunshine Lardeau treatment requirements.

H. A. Steane has accepted an appointment on the staff of Mount Morgan Ltd., Mount Morgan, Queensland, Australia. He was previously mill superintendent for Uruwira Minerals Ltd., Tanganyika.

A. K. Chakravarty has joined the Garividi Group of Mines at Madras in the Srikakulam District of India as mining engineer.

R. Pitman Hooper is now general manager at Broken Hill, Australia, for The Zinc Corporation Ltd., and New Broken Hill Consolidated Ltd.

F. T. M. White, professor of mining engineering, University of Queensland, left Australia at the end of November on a tour of mining and metallurgical centers. He is visiting South Africa, Northern Rhodesia, Cyprus, England, Austria, and India. He plans to return sometime in March.

P. I. A. Narayanan, assistant director of the National Metallurgical Laboratory, Tatanagar, India, has been in Australia for four months. He holds a United Nations fellowship and is spending his time visiting Australian laboratories and ore dressing plants.

W. H. Reeve has been appointed to take charge of the newly formed Geological Survey Department, Northern Rhodesia.

J. O. Eby of Asbestos, Quebec has been appointed as Jeffrey mine manager, Canadian Johns-Manville Company, Ltd. Other new appointments at the Jeffrey mine include **Charles D. Borror** as technical assistant to the Jeffrey mine manager; **Stuart K. Brigham** as plant engineer; **Hector H. Waller** as underground mine superintendent; and **Robert T. Cook** as assistant underground mine superintendent.

Visitors to Rhokana Copper Corporation's property at Nkana are fortunate recipients of famous Rhodesian hospitality from Mr. and Mrs. O. B. Bennett, he being the general manager of Anglo Corporation's American interests in that area. Prior to his appointment as general manager, Mr. Bennett made an extensive tour of outstanding mining properties throughout the United States. The picture was taken by Max Holsinger, *Mining World*, during his recent tour of Africa.

L. A. LYONS, smelter superintendent of the Electrolytic Refining & Smelting Company, Port Kembla, Australia has completed an 8,000-mile automobile trip through Africa and returned to Australia. During his tour this picture was taken of him and his car outside the Sabena guest house in Elizabethville, Belgian Congo. During the trip he visited mines and metallurgical plants in Tanganyika, Belgian Congo, the Rhodesias, and the Union of South Africa. Watch for his illustrated articles on current metallurgical practices in Africa in future issues of *Mining World*.

W. Bruce Cunningham was recently advanced to mine manager of the Rhodesia Chrome Mines, Ltd. in Southern Rhodesia.

H. R. Cooke, Jr. has joined the staff of the Northern Peru Mining & Smelting Company in Trujillo, Peru. Mr. Cooke was formerly with Graff & Kruger in Lima, **Peru.**

J. J. Timmins is now mine superintendent of the New Saza Mines, Ltd. in Tanganyika. Formerly, Mr. Timmins was general superintendent of the Rhamba Mines, Ltd. in Kenya Colony, Africa.

Kenneth H. Matheson has returned to Honduras to head an exploration crew for New York & Honduras Rosario Mining Company.

P. P. Shepherd is now working as a geologist for the Associated Tube Wells, Ltd. in the Ganges River valley of India. His headquarters are at Lucknow. He resigned from the Sierra Leone Selection Trust, Ltd., Sierra Leone, West Africa to take his present position.

George Hill is now mine superintendent of the Medina zinc mine which is being operated by the Las Playas Mining and Development Corporation. in Bogota, Colombia.

William Embry Wrather, head of the United States Geological Survey, and **Dr. William T. Pecora, Dr. George Switzer, Dr. Alfred J. Bodenlos** and **Mackenzie Gordon**, all of the Geological Survey, were the recipients of medals commemorating their work in Brazil in the survey of iron and manganese deposits in Minas Gerais, Mato Grosso, and Amapa Territory. The work, carried out jointly by Brazilian and United States engineers, resulted in mapping of iron and manganese deposits of upwards of 1,450,000,000 metric tons.

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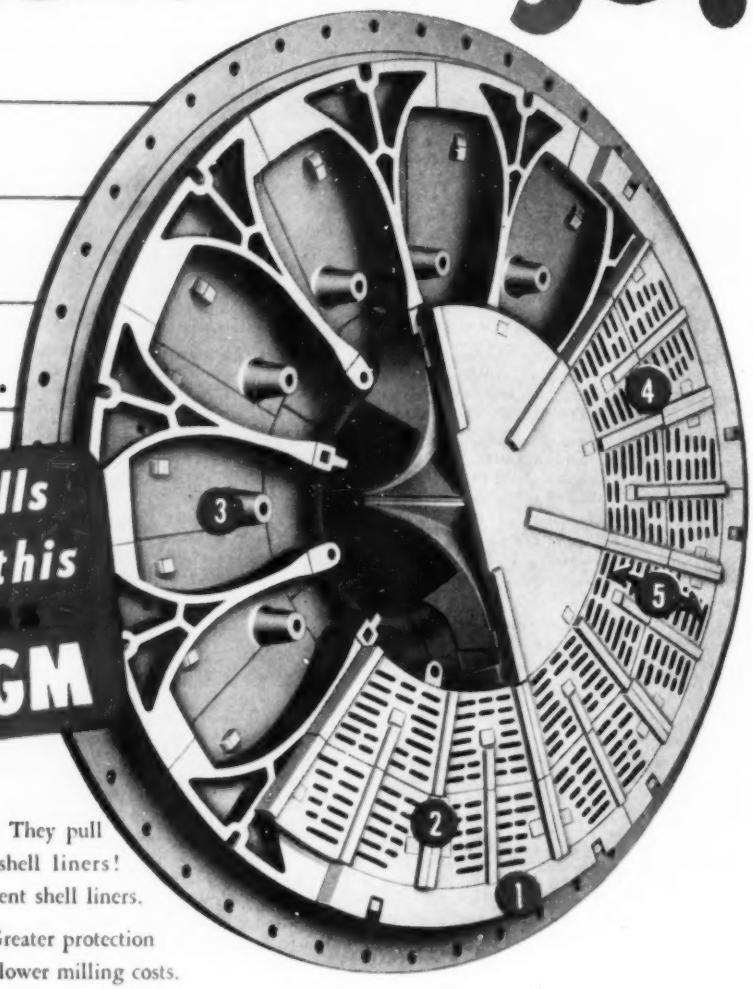

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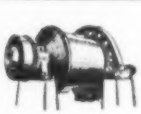
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INTERNATIONAL NEWS

Reserve Mining Gets First DPA Taconite Aid

The largest tax write-off for taconite aid was granted by the Defense Production Administration to the Reserve Mining Company. The firm received two certificates of necessity permitting it to write-off 75 percent of a total of $112,557,870. One certificate covers the new facility at Beaver Bay, Minnesota, and the other, the smaller taconite processing plant being built at Babbit, Minnesota.

Republic Steel Corporation and Armco Steel Corporation have jointly acquired the 15 percent interest in Reserve held by National Steel Corporation. This gives Republic and Armco each a 50 percent ownership. The two firms have expanded their blast furnace facilities and are interested in immediate development of Reserve's Minnesota operations to produce 2,500,000 tons of high-grade iron concentrate from taconite. National Steel, on the other hand, with large iron ore reserves, felt it would not require ore from this source for many years and so was willing to make the transfer.

Oliver Iron Mining Company, Duluth, Minnesota, received a 75 percent certification on $14,400,000; Hanna Iron Ore Company, Section 18 mine, Minnesota, received 65 percent certification of $45,500; and St. James Mining Company, Aurora, Minnesota, 65 percent on $2,973,585, all for iron ore production.

Mexican Silver Production Drops—Exports Steady

Mexico's silver production during 1951 totalled 42,000,000 ounces, according to Lic. Carlos Novoa, director general of the Bank of Mexico. If the current silver situation continues, said Mr. Novoa, Mexico's 1952 white metal output will be even lower than that of last year (50,000,000 ounces).

Though Mexico is producing less silver, the banker said, her exports of the metal continue at a good level. Mexico is negotiating with the Philippines and the Dominican Republic for the sale of silver, particularly money. Without citing figures, he reported that Mexico's best buyers of silver are Germany, France, and Guatemala, while Saudi Arabia buys the largest amount of silver money. In 1951, the Mexican silver ware industry used 1,000,000 ounces of silver, while the minting of Mexican money took 5,500,000 ounces.

Geologic Congress to Meet In Algiers In September

The 19th meeting of the International Geologic Congress is scheduled from September 8th to 15th in Algiers, Algeria. The French government is assisting in every way possible to insure the success of the Congress. German, English, Spanish, French, Italian, and Russian have been adopted as the official languages for the meeting.

One of the outstanding sessions will be a symposium on iron ore deposits which is being arranged by F. Blondel of Paris. Another symposium, arranged by C. Treichert of Victoria, Australia, will cover special problems of the stratigraphy of the Gondwana system in Australia, southern Asia and Africa.

As part of the Congress, the African Geologic Services will hold meetings and the International geologic map of Africa will be completed for first presentation at one of the meetings. The Society of Economic Geologists has also arranged for a special meeting of its members during the Congress.

Three series of special geologic field trips are being arranged. The first is to start about the 25th of August and will terminate in Algiers as the Congress opens. The second series will be in the form of short tours in Algeria during the meetings, and the third series will follow. One of the post Congress trips is scheduled to the Algerian Sahara and French West Africa during October.

Further information about the Congress may be obtained from F. Blondel 12 Rue de Bourgogne, Paris 7e, France.

Swedish Ore Conveyor Now Under Construction

The Luossavaara-Kiirunavaara Mining Company (LKAB) in northern Sweden is constructing a conveyor system for iron ore transports which will be 5 kilometers long. The conveyor, reported to be the first of its kind in Europe, will have an inclination of 16.5 degrees. Completion is expected in 1954 or 1955.

Under a new arrangement, all ore will be gathered at Vitafors where a new concentrator will be built. The company is also constructing 300 new mine wagons which will have a capacity of 20 to 25 tons instead of the present capacity of 2.5 tons.

Australian Al Plant To Produce By 1954

Production of aluminum at Bell Bay in Tasmania, Australia, is expected to be in full swing by the end of 1954, according to O. H. Beale, Minister for Supply. The project is being jointly financed by the Federal government's Aluminium Production Commission and the Tasmanian government.

Mr. Beale made his announcement following a conference with the Tasmanian Premier, R. Cosgrove, about financing the project. Mr. Cosgrove gave assurances that the Tasmanian Government would provide power and water for the aluminium industry.

The Federal government expects to move the Glen Davis oil refinery plants to Bell Bay which would enable the plant to use waste gases from the refinery to help produce aluminum ingots. The refinery would reduce the cost of the aluminum and would also produce about 16,000,000 gallons of automotive gasoline a year.

Japanese steel is being imported to speed up completion of the plant. Federal estimates are that the plant will need 80,000 tons of high-grade bauxite a year for an output of 13,000 tons of ingot aluminum. India will supply most of the bauxite during the early stages of production but eventually it is planned to draw on domestic deposits when technical and economic conditions permit.

Greater Free World Steel Capacity War Deterrent

The annual production of steel in Free Europe will increase to 62,000,000 tons, 23 percent over 1951 capacity, if the supply of materials allows present expansion plans to be fulfilled. This prediction was based on a compilation of estimates by Colonel Robert A. Solberg, vice president of Armco Steel Corporation's export activities in Europe.

The estimates included England's 16 percent increase to 18,000,000 long tons; France's 22 percent increase to 14,000,000 metric tons; West Germany's 28 percent increase to 18,000,000 metric tons; Italy's 25 percent increase to 3,500,000 metric tons; and the Benelux nations' 31 percent increase to 8,500,000 metric tons.

Combined with American capacity, expected to be 120,000,000 tons for the same period, these estimates would indicate that the Free World will have an annual steel production in excess of 180,000,000 tons.

From reports accepted as reliable, it is estimated that Russia's production of steel will increase to about 36,000,000 tons. This, together with satellite nations' expected production of 10,000,000 tons, would give the Communist World but little more than 25 percent of total Free World capacity—an important deterrent to war since steel production is considered to be the backbone of armed conflict.

Canadian-U.S. Copper And Zinc Arrangement

The Canadian government has arranged to make available to the United States this year, 15,800 short tons more of copper and 31,700 short tons more of zinc than were imported from Canada in 1951. The increase will bring Canadian shipments of copper and copper base alloy products to the United States to about 16 percent of the total Canadian production. While these amounts are not large in relation to total consumption of these metals in the United States, they are regarded as important under the present emergency situation.

United States consumption of refined copper is now about 1,400,000 tons a year, and the 15,800 tons increase amounts to about one percent of this total. Consumption of zinc in the U.S. was 1,064,000 tons in 1951. The increase of 31,700 tons amounts to about three percent of this total.

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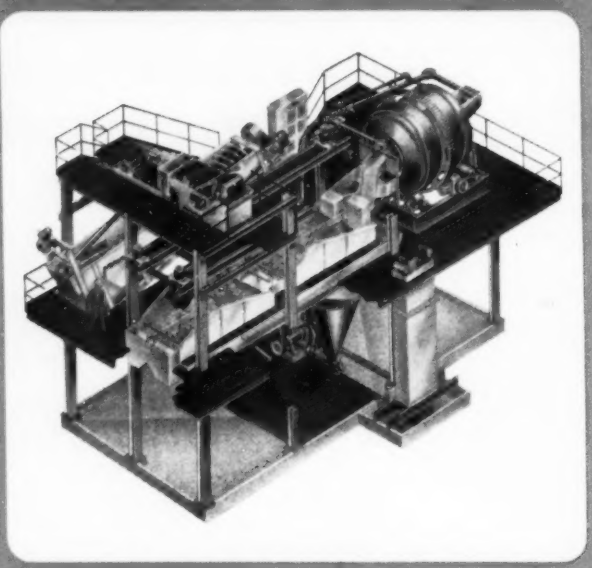

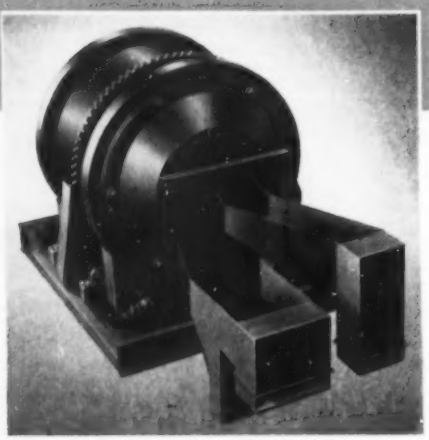

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Uruwira Receives MSA Loan To Increase Output

The Mutual Security Agency, acting on behalf of the United States Defense Materials Procurement Agency, has agreed to advance $1,640,000 to Uruwira Minerals, Limited for a development program at the firm's Mpanda mine in Tanganyika. The money will be used to purchase American mining equipment and services in order to boost the mine's output of lead and copper. A mill will be installed to handle 1,000 tons of ore daily.

Uruwira has agreed to spend an additional £325,000 on the mine's expansion. The over-all development program will include improved housing and general welfare provisions for mine workers.

The dollar advance will be repaid, plus five percent interest, in deliveries of lead and copper to U.S. stockpiles between January 1, 1954 and December 31, 1956. The United States will also receive an option to purchase up to 50 percent of the total Mpanda lead and copper production for 10 years after the advance and interests have been repaid.

To Mechanize Goa Iron Mines For Greater Output

Work is under way to transform the Goa iron mines in the Portuguese territory of India into the most modern mechanized mines in Asia. Completion of the project is expected by October of this year.

The plan is said to be sponsored by the Allied occupation authorities and the Japanese government under the South-East Asia Natural Resources Scheme. The Export Bank of Japan will finance the purchase of machinery with repayment to be made by way of a pro rata export of 1,500,000 tons of iron to Japan after mechanization. The Kokan Mining Company of Japan will send engineers and technicians to the area.

Annual production is expected to increase from its present rate of 200,000 tons to 1,000,000 tons after the improvements are completed. However, because of the lack of port facilities at Goa, output might have to be restricted to 500,000 tons for some time.

Aluminum Firm Expands In Canada and Jamaica

The Canadian aluminum producer, Aluminium Limited, has embarked upon a $20,000,000 expansion program which will increase its bauxite-alumina production facilities on the Island of Jamaica by 150 percent.

The company's plant at Jamaica is being expanded from 200 to 500 short tons of alumina daily. Later, the output will be increased to 740 tons a day. Most of this will go to the new aluminum smelter plant being built in British Columbia by the firm's subsidiary, Aluminum Company of Canada, Ltd. Production from this smelter is expected early in 1954, with an initial capacity of 90,000 short tons of aluminum annually.

Shipment of the first alumina from the Jamaica plant which is now under construction will be some time late in 1952. Output from the proposed expanded plant will start late in 1953.

Present aluminum metal producing capacity of Aluminium Limited is 450,000 tons a year. By the third quarter of 1952, this should be increased to 495,000 tons through expansion of the firm's smelter at Arveda, Quebec, which is now in progress. Another 45,000 tons will be added to the Arveda output in 1953, bringing the capacity up to 540,000 tons. In 1954, the British Columbia expansion will add another 90,000 tons, making total aluminum production from Aluminium, 630,000 tons a year.

New Brazilian Firm Starts Beryllium Oxide Production

About 90 tons of beryllium oxide will be produced annually by a new Brazilian mill which will start production this month. Located at Resende in the state of Rio de Janeiro, the mill will be operated by a new firm—Proberil, S.A.—which was organized in Sao Paulo with mixed Brazilian-American capital.

Raw material will come from the largest known beryllium mine in Brazil, located in the state of Minas Gerais. Deposits are also found in the states of Bahia, Rio Grande do Norte, and Paraiba. Sulphuric acid used in the process will be made at Barra Mansa in Minas.

COMINCO To Explore Thailand Lead-Zinc Mine

Consolidated Mining and Smelting Company of Trail, British Columbia, will explore a lead-zinc mine in Northwest Thailand. The mine has been shipping ore from Thailand to the Trail smelter for more than a year.

An agreement has recently been signed between Consolidated and United Minerals Ltd. of Bangkok, owner of the property, which provides for continued ore production under Consolidated supervision while the exploration program is going on. J. J. McKay of Cominco's mines department will go to Thailand to take charge of the operation.

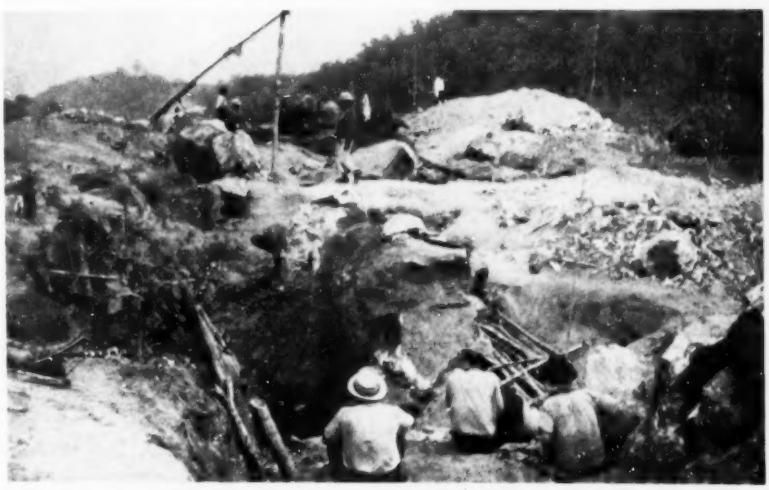
DPA Wants 8,400,000-ton Sulfur Production by 1955

The Defense Production Administration has set an annual production goal for 1955 of 8,400,000 long tons of sulfur and sulfur equivalents. This would mean an increase of 38 percent over 1950 production. Since DPA estimates that 1955 requirements will be 43 percent over those of 1950, it is planned that the 7 percent discrepancy between the increases in production and requirements will be met by decreased exports as foreign markets are supplied locally from newly developed deposits.

The increased production is to be stimulated by an extension of present government programs authorizing certificates of necessity to amortize investments more rapidly for tax purposes, new purchase contracts, and government loans for exploration and development.

Alaskan Company Develops Copper Deposit

Development work of the Peninsula Exploration Company at its property located on Sitkalidak Island, Alaska includes driving a tunnel on East Jack Creek and exposing known croppings. The mouth of the tunnel is at approximately a 700-foot elevation and will have



WOLFRAMITE HAND-MINED IN THAILAND

The great demand for tungsten in rearmament programs has stimulated mining activity throughout the world. Pictured here is a scene at Ma Sarieng, northern Thailand (Siam), where high-grade wolframite ore is mined by hand from shallow workings. Note the native "whip" hoist mounted on the vertical pole in the background.

1,000 feet of overburden by running 1,200 to 1,400 feet in a southerly direction. The vein has been traced for 750 feet with seven outcroppings showing in this distance. Two spurs running off the vein have also been traced.

Peninsula Exploration owns nine claims on the Sitkalidak Contact Copper deposit which carries principally copper, with a little gold and silver at the contact of limestone and quartz diorite, granodiorite and rhyolite. Approach to the property is made at Amee Bay on Sitkalidak Straits where the company has a temporary camp. The company was founded to develop prospects lying close to water transportation and has a group of claims on the Alaskan Peninsula at Agripina Bay carrying zinc, lead, and silver. Development work is expected to start here next fall.

Successful Experiment In Generating Power

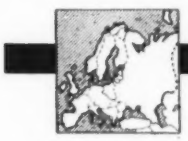
Small amounts of electric power have been produced from heat energy released in the operation of the experimental breeder reactor, recently completed at the National Reactor Testing Station in Idaho.

In a trial run, electrical power of more than 100 kilowatts was generated and used to operate the pumps and other reactor equipment, and to provide light and electrical facilities for the building that houses it. Test operations will be resumed after further adjustments of the reactor system.

The new reactor was designed and is operated by the Argonne National Laboratory, Lemont, Illinois—the reactor research center run for the United States Atomic Energy Commission by the University of Chicago.

Steep Rock Ore Body To Be Explored

At a cost of $600,000, exploration of part of the "C" ore body at Steep Rock Iron mines in the Atikokan area of Ontario, Canada, will be undertaken by Pickands-Mather Iron Company. Preliminary work, scheduled to start after the winter months, will include diamond drilling and geophysical surveys. Pickands-Mather is one of the five largest iron-mining companies in the world.



GREECE—Production of 14 basic minerals, nearly all of them strategic metals of high importance to western defense, amounted during the first nine months of 1951 to nearly double the total production for the entire preceding year. A report prepared by the mining section of the Mutual Security Agency Mission to Greece showed that during all of 1950, Greece produced 252,986 metric tons of the minerals and exported 206,598 tons at a value of $2,220,313. From January 1 through September 30 of 1951, Greece produced 439,315 tons and exported 372,088, at a value of $4,011,885. This includes barite, bauxite, emery and caustic magnesite; concentrates of pyrites, lead, and zinc; and ores of antimony, chrome, copper, iron, iron-manganese, magnesite, and manganese. Lignite, which is not included, was termed the most important single development in the mining field during the year. It is expected to replace solid fuel imports.

ENGLAND—The *Derbyshire Stone Company Ltd.* reports that the *Johannesburg Consolidated Investment Company* has put down eight bore holes near Matlock and has found a lead vein but it is largely worked out. However, area to the east of the Derwent River seems to hold promise and boring is continuing. If sufficient lead reserves are found, a joint company will be formed to mine the mineral.

FRANCE—*Les Amiantes de France* is working a rich deposit of asbestos in the French Alps near the Italian border. It is estimated to contain 8,000,000 cubic meters. American capital and funds from the French government are invested in the company. The company hopes to produce 15 to 20 percent of the needs of France, which were 40,000 tons last year.

SWEDEN—The long-range expansion program of the *A. B. Zinkgruvor Company* is scheduled for completion this year. It should increase production by about 3,000 metric tons of recoverable zinc and 1,000 metric tons of recoverable lead per year. The five zinc-lead-copper mines near Falun were involved in the expansion.

AUSTRIA—The *Alpine Montangesellschaft* has ordered a pre-fabricated HMS plant Ore and Chemical Corporation with fabrication by *Western Machinery Company*. Alpine is the largest iron and steel producer in Austria. The new plant will have a 300-ton-per-hour designed capacity and will use a 10 by 10-foot drum separator to treat the minus-4-inch, plus-10-mesh iron ore from the open-pit mine near Eisenerz, Austria.

WALES—In North Wales the new lead concentrator in the Conway Valley is in operation. The *Halkyn District United Mines* in Flintshire showed a profit of £33,723 last year, and a dividend of 10 percent was declared.

SWEDEN—To expedite the flow of iron ore being mined, Sweden has begun to extend her section of the Kiruna-Narvik railway. Triple tracks are being laid at the 12 stations between Kiruna and Abisko and the signal system is being extended. With these improvements, the average length of trains may be increased from 44 to 70 cars. Norway is also planning to extend her section of the line and the Parliament will be asked to appropriate the necessary 10,000,000 crowns shortly.

U.S.S.R.—The Soviet Press has reported that iron and steel production fulfilled the 1951 quota four days before the end of that year. Pig iron is supposed to have risen 4,000,000 metric tons over the previous year and steel output is now reported to be more than 30,000,000 metric tons annually. The Soviet output on the basis of these figures is second only to the United States and exceeds that of Britain

NEW BRITISH SUPERPHOSPHATE PLANT

The new, ultra-modern fertilizer works of Fisons, Limited at Immingham, England, is Britain's first triple superphosphate plant. The two buildings in the foreground, identified by the horizontal window design, house the phosphoric acid and triple superphosphate granulation processing units. These units were designed by The Dorr Company's Consulting Engineering Division in Stamford, Connecticut and use the Dorrco Strong Acid and Granulation Processes. A large part of the equipment was supplied by Dorr-Oliver Company, Ltd. in London. Annual design capacity of the plant is 70,000 tons of triple superphosphate, 50,000 tons of single superphosphate, and 75,000 tons of granular compounds.

or Germany by about 15,000,000 metric tons.

EAST GERMANY—A new wave of deportation is being carried out in East Germany. The inhabitants of 93 towns and 400 municipalities are reported to have been sent to Silesia in southwestern Poland for slave labor in the uranium mines. Other deportees have been sent to the U.S.S.R.

CZECHOSLOVAKIA—The Czechoslovakian police have made 200 arrests in connection with a fire at the uranium mines near Karlovy Vary which is believed to be the work of saboteurs.

YUGOSLAVIA—Copper production for 1951 is said to be about one-third of pre-war output, or 14,000 tons. The decline is attributed to extensive wartime destruction and increasing difficulty in exploiting the *Bor* deposits which have been worked for decades. A newly discovered deposit at Majdanpek in Serbia, believed to be larger than Bor, is now being developed. A new electrolytic plant at Bor is expected to increase the country's 1952 copper output by 10,000 tons to 24,000 tons.

ENGLAND—A 1,500,000-ton steel shortage has caused government officials to restrict allocation to manufacturers on the basis of priority of national interest. Reduced production, rising demands for rearmament, and the necessity to maintain a high level of exports of plant machinery and steel products are blamed for the shortage.

SWEDEN—A reconstruction program is being carried out by *Boliden Company* on its copper plant at Roennskaer, North Sweden. New installations are being built for the anode and cathode furnaces and total expenditure will be 6,000,000 crowns. Completion is expected within 18 months and the anode plant will be ready by the beginning of next summer.

GERMANY—The *Ruhrstahl A. G.* has been newly formed with head offices at Hattingen. It consists of the Hattingen, Annen, and Brackwede plants of the old company of the same name.

FRANCE—Aluminum output for 1951 may reach 115,000 tons which is almost double the pre-war output; yet demand will still be greater than the industry can supply in 1952. Demand is estimated at about 130,000 tons, 30,000 to 40,000 of which is stimulated by rearmament. Production increases in 1952 depend upon the supply of hydro-electric power. Bauxite supplies are said to be adequate. French mines exceeded 1,000,000 tons in output during 1951, compared with 850,000 tons in 1950. French aluminum producers usually require only about 450,000 tons of this. Aluminum exports were banned by the government during 1951 in order to provide for the increased home demand. Commitments under existing agreements with Holland and South America were fulfilled. *L'Aluminium Francais* handles all aluminum sales in France, acting on behalf of two producing companies—*Pechinery* (80 percent of total output) and *Ugine* (20 percent).

GERMANY—A newly formed company is now operating the mines belonging to the *Vereinigte Stahlwerke Company* which is in liquidation. A substantial increase in iron ore output is reported. Production rose from 2,722,000 tons in the 1949-50 business year, to 3,067,000 tons in 1950-51, a gain of more than 12.5 percent.

SPAIN—*Echevarria Limited* is proceeding with installation of an electric furnace which will produce 12,000 tons of special steel a year.

AUSTRIA—Continued demand for Austrian aluminum is likely to result in the highest level of production for the country since 1945. A total output of 26,000 to 27,000 tons has been forecast for 1951, as compared with 18,000 tons in 1950 and 14,000 tons in 1940. The modern plant at Ranshofen in Upper Austria will have supplied 21,000 tons of this amount and the remainder will have come from the *Salzburger Aluminumwerke* at Salzburg. The *Ranshofen* was built by the Germans during the war to provide an annual capacity of 60,000 tons. This winter, for the first time, the plant is running at only half its capacity because of an electric power shortage. Austria strongly lacks aluminum bearing raw material. During the first nine months of 1951 she was compelled to import 36,272 tons of calcined alumina. France supplied 16,362 tons, Italy—8,781 tons, West Germany—8,415 tons, and Yugoslavia—2,115 tons.

Plans to build an alumina plant in Austria have been discussed but shelved because of the lack of workable bauxite deposits.

SCOTLAND—The *Siamese Tin Syndicate Ltd.* and its associated undertaking, *Bangrin Tin Dredging Company, Ltd.*, have jointly taken an option to purchase the mineral and certain other rights in the Leadhills-Wanlockhead area of South Lanarkshire and North Dumfriesshire, should the exploratory work being undertaken over an area of about 12 square miles prove the existence of suitable grade ore. Leadhills closed about 20 years ago but had been working since the 13th Century. Wanlockhead closed about 15 years ago and at that time the price of lead was only £10 per ton. The report of the Westwood committee on mineral resources said that at Wanlockhead the ore reserves were equivalent to about 18,750 tons of 80 percent lead concentrate and about 15,500 tons of 45 percent zinc concentrate, about one-half of each being reasonably certain and the other half "probable."

AFRICA

SOUTH AFRICA—The sub-vertical section of the No. 3 shaft being sunk jointly by the *Western Reefs Exploration and Development Company, Ltd.*, and the *Vaal Reefs Exploration and Mining Company, Ltd.*, intersected the Vaal Reef at 5,882 feet below the surface, or 2,095 feet below the underground hoist chamber level. The reef was reported fully exposed over the total perimeter of the shaft and averaged 75.62 dwt. over 6.16 inches, or 466 inch-dwts. Further north, in borehole TL29, drilled by *Middle Witwatersrand, Ltd.*, 3,300 feet northwest of the common boundary of the Klerksdorp Townlands 44, Zandpan 43, and the Western Reefs property, the Vaal Reef was located at 6,445 feet in four deflections with values of 613, 430, and 960 inch-dwts. In one of the deflections, the core was badly ground and no assays were effected.

FRENCH WEST AFRICA—Arrangements have been made to move in drills, crews, and a large amount of equipment necessary to conduct diamond drilling at the iron ore deposits located near the old Foreign Legion post of Fort Gouraud in Mauritania. French, British, and Canadian capital are sharing in the development. The company which will operate the deposits will be known as *Companie des Mines de Fer Mauretanie*, and will be called *Miferma* for short. *Frobisher, Ltd.* (Canadian) holds 34 percent interest; the French hold a 51 percent interest, part of the funds being subscribed by the government's *Bureau Miniere;* and the remaining 15 percent interest is held by *British Iron and Steel Corporation*, generally known as *BISC (Ore)*. Five principal orebodies have been outlined to date.

SOUTHERN RHODESIA—*Strathmore Consolidated Investments, Ltd.* has purchased the *Hippo* tungsten mine, which includes 15 block base metal claims about 180 miles south of Umtali. Immediate development of the deposit is planned. The circular shaft of the *Ellaton* mine, also owned by Strathmore, has reached a depth of 260 feet. A crosscut to the reef at a depth of 270 feet is expected to intersect the reef. Development on the reef will then begin.

TRANSVAAL—Milling by the *Northern Transvaal (Messine) Copper Company* may begin toward the end of this year. In the Molly shaft area, an ore reserve of 70,000 tons averaging about 2 percent copper, had been proved, but it was not yet possible to estimate the reserve in the No. 9A shaft area, where the disclosures were described as encouraging. An additional plant installed since last June has enabled the company to advance operations more quickly and the No. 9A shaft has now reached the third level. A good copper-bearing ore is said to have been exposed.

SOUTH AFRICA—Production of asbestos at *African Asbestos-Cement Corporation, Limited's* mine at Kalkkloof was higher during 1951 than in the previous twelve months. Improvement was brought about by better grade of ore supplied to the mill and by more efficient working of the mill, where a

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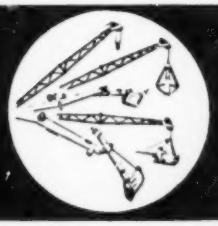

SHOVELS
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larger percentage of the shorter grade of asbestos fibre has been recovered. In the mine, shaft sinking has been resumed and early in 1952, the third level station should be completed, and the main reef exposed on both the Main and X lodes. The reef on both these lodes has been much better on the second level than it was on the first, and it is expected that this improvement will at least be maintained on the third level. Development at the company's mine in the Cape province has continued satisfactorily and fibre is reported to be of good quantities sufficient to warrant erection of a mill. The mill is under construction and production should get under way soon.

UGANDA—A Government committee has recommended the extension of the railway system for more than 200 miles westward from Kampala to the vicinity of the important copper deposits at Kilembe. The proposed £4,000,000 railway extension would end at Lake George and would open up a large area in Western Uganda which is now only sparsely populated. The Kilembe copper mines are being exploited by leading companies, including *Frobishers* of Canada, and *Rio Tinto* of London. Plans are to produce 5,000 tons of ore daily. The committee recommended that the ore, instead of being treated on the spot, should be shipped to Jinja Jinja, where the new hydro-electric scheme on the Nile would enable the ore to be economically treated.

SOUTHWEST AFRICA—S. A. Min*erals Corporation, Limited* has acquired the farms "Bosrand" No. 395 and "Ebenezer" No. 377, both situated in the Otjiwarango district of South West Africa, at a total purchase price of £22,750. Since the close of the fiscal year, the firm has made a further shipment of 2,000 tons of manganese ore to the United States and an additional 5,000 tons was to have been made shortly. Production now enables a minimum amount of 1,500 tons of plus 48 percent ore to be available per month, apart from lower grades of ore which are readily saleable at satisfactory prices. In 1951, an arrangement was concluded with *Groenfontein Chrome Mines, Limited* to acquire 42 base mineral claims. In lieu of the purchase price of £65,000, Groenfontein has a right until July 31, 1953 to subscribe for 300,000 ordinary shares in the reserve capital of S.A. Minerals at £1 per share, and to receive royalties on all manganese sold. S.A. Minerals now owns all the mineral claims in that area which is surrounded by an area of some 350 square miles which the Administration has by proclamation reserved from pegging for a further period of one year from the first of September, 1951.

SIERRA LEONE—A British expedition has left Freetown on a geological exploration of Sierra Leone and the Gold Coast. They hope to discover whether there are workable deposits of uranium and thorium, essential for atomic energy projects. The expedition will use a new type of Geiger counter detecting equipment, mounted on Land Rover vehicles, which will automatically record the presence of these elements in the subsoil and will also show whether the quantities are significant.

SOUTHERN RHODESIA—*Anglo-Huronian, Ltd.* has entered the Southern Rhodesian asbestos field through its 11⅓ percent participation in a newly formed Toronto company, *Rhodesian Asbestos, Limited*. *Johns-Manville Corporation* has the controlling interest. The main properties of Rhodesian Asbestos, Ltd., purchased or under option, are in the Mashaba District, about 165 air miles south of Salisbury and 120 miles east of Bulawayo. The properties are known as the *Temeraire*, *Shashi*, and *Shamala*. Up to the present time, over $1,000,000 has been spent in developing and acquiring these properties by the Patino interests and the *British Metal Corporation* of London. Johns-Manville has advanced about $270,000 to carry out an extensive geological and diamond drilling campaign on the properties.

SOUTH AFRICA—Equipping of the *Union Tin Mines, Ltd.* property has proceeded rapidly. Trial runs of the reduction plant have been completed and production will begin soon. The *Anglo-Rand Mining and Finance Company* is now a substantial shareholder in Union Tin.

NIGERIA—*Jantar Nigeria Company, Ltd.*, the tin and columbite producer, forged rapidly ahead during 1951. Production increased to 266 tons for tin, and 232 tons for columbite. The dividend was raised and £45,000 were marked for re-

serve to be used in a unique mining experiment. The company is searching for an economic method of mining tin which is contained in gravels overlain by a layer of basalt. Currently, drilling is continuing and has indicated 2,500 tons of tin reserves in the area. The company's management is considering underground mining methods for recovery of the tin-bearing gravels and equipment necessary to carry out an underground experiment has been ordered.

NEWFOUNDLAND—United States and Canadian financiers have joined the Newfoundland Government in a new corporation called the *Newfoundland and Labrador Corporation* with an authorized capital of $10,000,000. The government will hold 90 percent of the shares. Exploration will start shortly on the 110,000 square miles of Newfoundland. First prospecting parties will concentrate on titanium deposits.

ONTARIO—The *Marmorton Company*, a subsidiary of *Bethlehem Steel Company*, has started preliminary work in preparation for mining iron ore at Marmora, 100 miles east of Toronto. A 150-foot capping of limestone must be removed to expose the ore. This is expected to be completed in 1953. The ore is expected to average about 40 percent iron, and about 400,000 tons of concentrates are anticipated per year when production has started.

ALBERTA—A new nickel refinery will be built by *Sherritt Gordon Mines, Ltd.* this spring or early summer on an 800-acre tract at Fort Saskatchewan. When completed in the fall of 1953, it will produce 17,000,000 pounds of refined nickel annually. It will also produce 1,500 tons of copper sulphide, 300,000 pounds of refined cobalt, and 70,000 tons of ammonium sulphate fertilizer. Concentrates will be shipped from Lynn Lake in northern Manitoba 860 miles by Canadian National Railway.

BRITISH COLUMBIA—The "77" vein on the 26th level at the *Bralorne Mines Ltd.* property has been driven to the west a distance of 437 feet, developing an ore shoot and giving generally encouraging results. A system of transfer ore and waste rock raises has been started from the Crown 25th level and a breakthrough has been made on the 24th and 23rd levels. Crosscuts from the 24th and 25th Crown stations have been driven toward the "77" vein. During the entire year, 168,194 dry tons were milled, from which 79,579 ounces of gold were recovered.

ALASKA—A report has been prepared on pumice deposits in the Alaska Peninsula-Cook Inlet region by the United States Geological Survey. Three principal areas of deposition have been found: Katmai National Monument; Augustine Island; and the Veniaminof-Aniakchak area. In selecting deposits with commercial possibilities, the following were limiting factors: (1) the deposit must be located within a reasonable distance of the market, which at present is Anchorage; (2) it must be reasonably accessible to transportation facilities; and (3) adequate shelter must be available for loading facilities. Therefore, the area referred to in

the report is restricted to Kodiak and Augustine Islands and that portion of the Alaska Peninsula lying between the Pacific Coast and the crest of the Alaska Range. Roads are practically nonexistent in the region and airplanes are the chief means of transportation. Limited free mimeographed copies may be obtained by writing to the Director, Geological Survey, Washington 25, D. C.

NORTHWEST TERRITORIES—*Giant Yellowknife Gold Mines Limited* reports that for the quarter ended November 30, 1951, 36,506 tons were milled. From this, 24,836.636 ounces of gold were recovered and 8,381.25 ounces of silver were recovered.

ONTARIO—*Headway Red Lake Gold Mines Ltd.* has sold its 23-claim Onaman River area property 40 miles northwest of Geraldton. *Headvue Mines Ltd.*, a new company, has agreed to spend $75,000 to explore the group, and also 18 claims it already holds. Headway will receive 900,000 shares of the new company and will be entitled to nominate one member to the Headvue board of directors. A program of 20,000 feet of diamond drilling is now under way.

PENNSYLVANIA—The *United States Defense Production Administration* is considering a $55,950,000 loan to the *Central Iron & Steel Company* of Harrisburg, Pennsylvania. The money would be used to expand present steel-making facilities of the firm at Harrisburg and at Phoenixville, Pennsylvania. The loan is pending while the DPA decides whether it will award a certificate of necessity to the company.

QUEBEC—Surface open cuts are being dug on the base metal zone outlined in surface work on the property of *Miller Copper Mines* at Gaspe, Quebec. Approximately 180 pits have been dug on the property, which consists of 63 claims, totaling 2,412 acres. Copper mineralization is said to exist over wide areas.

ONTARIO—The *Montreal River Silver Syndicate, Ltd.* is in the process of liquidating. Assets to be distributed consist of 225,000 shares of *Silverside Mines, Ltd.*, formed in 1949 on the single claim in Lorraine Township, Ontario, held originally by the Syndicate.

ALASKA—The lack of metal markets in the Alaskan Territory has brought mining for strategic base minerals almost to a standstill, according to Lee Saarela, commissioner for mines in Alaska. He reports that at least one chrome property at Red Mountain, Kenai Peninsula, is ready to go into immediate production but the mine is not in operation because no one is interested in buying chrome in Alaska. During World War II, federal purchasing agents with authorization to buy certain strategic minerals were stationed at Nome, Anchorage, and Fairbanks. With a guaranteed market, properties continued to operate during the war. The program ended in 1944, however, and in spite of the need for these critical materials, government purchasing has not been resumed.

YUKON TERRITORY—*Yukore Mines Limited* has completed final arrangements for the company's 1952 program of reopening the *Idaho Hill* lead-silver mines, acquired last fall. The Idaho Hill, 30 miles south of White horse, was the first lode silver deposit discovered in the area. Yukore Mines has allocated $25,000 for the first exploration and development program. A crew is being hired. A compressor and other equipment have already been shipped to the property. Three adits have been run into the hillsides and one of the first objectives of the current program is to lengthen the main adit 500 feet. This is expected to intersect known veins in the area. Drifting will start on the veins already exposed at the end of this adit.

ONTARIO—For the fiscal year ended September 1951, *New Calumet Mines, Ltd.* reports production valued at $5,146,523, from the treatment of 259,214 tons of ore. After deductions, this left a net profit of $1,088,970. Ore reserves increased to 927,285 tons from 815,886 tons. Grade of ore reserves is reported at approximately 6.7 percent zinc, 1.6 percent lead, 4.23 ounces of silver, and 0.017 ounces of gold.

SASKATCHEWAN—Agreements have been reached between *Amax Athabasca Uranium Mines, Limited, Aurora Uranium & Gold Mines Limited*, and *Leadridge Mining Company Limited*, a subsidiary of *St. Joseph Lead Company*, covering the prospecting and development of properties controlled by Amax and Aurora in the Beaver Lodge Lake area, in the northwest corner of Saskatchewan. The agreement provides for expenditure by Leadridge of substantial sums on each of the concessions. Options are also granted whereby Leadridge is given the opportunity to acquire working control of both of the companies. Exploration for uranium has been going on in this area for some time but this is believed to be the first time a major American firm has become interested.

QUEBEC—Plans have been approved for a major expansion and replacement program at the *Jeffrey* mine at Asbestos, Quebec, by the *Canadian Johns-Manville Company*. The site has been cleared for a new mill to extract asbestos fibre from ore. The *Munro* asbestos mine and mill near Matheson, Ontario, begun in 1949, reached full production in 1951.

ONTARIO—*Newlund Mines Ltd.* has begun shaft deepening at its property in northwestern Ontario. The shaft will be taken down from 525 feet to 825 feet and a fourth level will be established at 800 feet. Completion is expected some time in April. In the east section of the mine, the drive on the 200-foot level has reached a point about 1,200-feet east of the shaft, or some 600 feet short of the original No. 1 zone indicated in surface drilling. On the 500-foot level, the east heading is now vertically below an earlier crosscut on the 200-foot level which gave 0.25 ounces of gold across 28 feet.

COLORADO—More than a quarter million dollars was paid out during 1951 to uranium ore producers under the new incentive bonus program of the *United States Atomic Energy Commission*. The graduated bonus arrangement was established in June 1951 and was retroactive to March 1 of that same year. It was one of several steps taken by the AEC to stimulate domestic production of uranium. The payments have resulted in a sizable increase in the income of many small mining operators and have stepped up output of this raw material for the atomic energy program. Approximately one-third of the 70 mines which have been certified for bonus payments had no production prior to March 1, 1951. The bonus is offered to new producers and certain existing producers on that part of the first 10,000 pounds of uranium oxide in acceptable ore delivered to qualified mills or ore buying stations between March 1, 1951 and February 28, 1954. By the end of 1951, about 190 applications for certification of mining properties for bonus had been received by the Colorado Raw Materials Office at Grand Junction. More than one-third of these have been acted upon and the rest are being processed as rapidly as possible.

BRITISH COLUMBIA—The past year has witnessed a tremendous influx of mining capitol into British Columbia from eastern Canada and the United States, according to Frank Woodside, manager of the B.C. and Yukon Chamber of Mines. Numerous companies with headquarters in Toronto and New York have opened exploration offices in Vancouver and have prospecting parties in the field. Mr. Woodside says that one of the most promising of the important new mining developments in northern B.C. is that of *Conucst Exploration Company* with a large deposit of chrysotile asbestos on McDame Creek. Development of a rich silver, lead, zinc mining area at Mayo and Keno Hill is considered an outstanding achievement in the Yukon Territory.

MANITOBA—The original six-claim property of *Manitoba Basin Consolidated Mines Ltd.* in the Herb Lake mining area east of Flin Flon has been acquired by *Consolidated Lebel Oro Mines Ltd.* The property was a copper-zinc prospect and was explored in 1928 and 1929. The new company is said to be interested in the area as an oil prospect.

ONTARIO—Work has started at the 29-claim property of *Coldstream Copper Mines*, 90 miles west of Fort Williams. In addition to unwatering the old No. 1 shaft which was sunk to 200 feet by former operators, a new 375-foot, three-compartment shaft is to be sunk. About 5,000 feet of driving will be done on two levels, along with some raising, and 5,000 feet of underground diamond drilling. Cost of the project is estimated at $350,000.

SASKATCHEWAN—*Mayo Mines Ltd.* has purchased 300,000 shares of *Baska Uranium Mines Ltd.* This will insure Baska of additional funds to pursue an intensive program of exploration on its three properties in the Beaverlodge uranium area of Saskatchewan. Mayo Mines will direct work at the properties and will have three directors on the five-man board. Baska has carried out surface exploration on the *Walberg* group which adjoins the *Eagle* property of *Eldorado Mining & Refining Ltd.* Baska's *Fish Lake* group adjoins property of *Radiore Uranium Mines Ltd.* No work has been done on the third group known as Rags Lake.

COLORADO—The *Golden Cycle Corporation* has inaugurated a new and lower royalty schedule for lessees at its Cripple Creek, Colorado, gold mines. Under the new schedule, ore valued up to $17.50 per tons will have a royalty of 7.5 percent, that from $17.50 to $35.00 a royalty of 12.5 percent, with a gradual increase to a royalty of 30 percent for all ore worth $82.50 per ton or higher.

LATIN AMERICA

BOLIVIA—A loan of $580,000 has been approved by the *Export-Import Bank* to *Compagnie Aramayo de Mines en Bolivie*. The money will be used to help finance expansion of tungsten production from the *Pacuni* mine which has extensive ore reserves. In return for the loan, tungsten produced from the mine between 1952 and 1954 will be sold to the *United States Emergency Procurement Service* to boost its supply of the strategic material.

COLOMBIA—Jose Bedoya of Remedios, Antioquia, has a crew of 25 men working at his *La Aparacida* mine near Segovia. Mine production is about 15 tons per day and the ore is treated in a small stamp mill, followed by leaching.

BRAZIL—A $500,000 contract has been awarded to the *Bliss Company* of Salem,

ARGENTINE GOLD MINE STILL ACTIVE

An aerial view of the gold mines at Incahuasi in the province of Catamarca, Argentina, showing the amalgamation-cyanide plant, electric power house, and adjacent installations. Gold is mined to a depth of 480 feet from eight veins, having widths of from one to three feet. The amalgamation-cyanide plant has a capacity of 40 tons daily. Operation of the mines dates back to the early colonization period of the Spaniards. Later work was carried on by the Jesuits until 1777. Activity was renewed in 1810 and continued on a primitive scale until 1936 when the new plant was installed.

Ohio for design and manufacture of hot strip mill auxiliary equipment to be used in expansion of the *Volta Redonda* steel mills. Deliveries will begin in the fall of 1952. Volta Redonda's output is to be increased to more than 1,000,000 tons of steel annually which should take care of all of Brazil's requirements. At present, all Brazilian steel mills together produce about 600,000 tons yearly, while another 300,000 tons are imported.

MEXICO—Special export of 10,000 silver bars, weighing 35 tons, was made by Mexico to Western Germany. The transaction was made by the Bank of Mexico which indicated that Germany had bought the silver, valued at $960,000, for minting. The consignment was sent under heavy guard from Mexico, D. F. to Tampico, where it was loaded on a German freighter. The shipment was the largest made by Mexico to any European country since World War II started.

COLOMBIA—Gabriel and Arturo Gomez C. report favorable results from their *Mina San Pacho*, which is located in the Department of Bolivar, Colombia. Development work is continuing to show good ore with the vein averaging seventy centimeters in width and fifty grams of gold per ton. San Pacho is located in one of the richest but most inaccessable areas of Colombia. Under the most favorable conditions, it takes two to three days hard riding by horse to get into the property, and during the rainy season it sometimes takes two and three weeks. Ore is being treated in a small stamp mill. In spite of difficult operating conditions, the operation is showing a substantial profit. A crew of ten men is presently employed.

BOLIVIA—The *Empresa Minera Juliana*, formerly well-known for its pure scheelite, and closed down for many years, has been auctioned. It will begin operation again as the *Empresa Minera Fenix*.

MEXICO—The *Neustra Sonora Culican* is increasing capacity of its base metal concentrator at Sinaloa, Mexico. The 400-ton-per-day addition includes a Marcy 78 ball mill in closed circuit with a Wemco 78-inch classifier.

VENEZUELA—*Morrison-Knudsen de Venezuela*, an affiliate of *Morrison-Knudsen Company, Inc.*, of Boise, Idaho, has been awarded a contract by *Orinoco Mining Company* to construct a 90-mile railroad from Puerto Ordaz on the Orinoco River to the Cerro Bolivar mine. This will be a standard gauge Class A railroad. The contract also includes construction of a parallel highway. Orinoco is a subsidiary of the *United States Steel Company*.

BRAZIL—Brazilian and American engineers have completed initial surveys and mining operations in the Amapá manganese fields. Some 10,000,000 metric tons of high-grade manganese ore is reported to be available for mining in the Serra do Navio area. A joint Brazilian-American company called *Icomi, S.A.* is in charge of operations there.

COLOMBIA—A 34 by 11½-foot river service boat will be built by *Pato Consolidated Gold Dredging Company, Ltd.* for its own use on the Nechi River, a tributary of the Magdalena. The boat is to be used as a fast service personnel carrier and will service two gold dredges from a base camp with a minimum loss of travel time. The craft will draw only two feet of water in order to meet varying river conditions—low water during the dry season and heavy, troublesome currents carrying considerable debris during the rainy season. Pato Consolidated has its own boat building and repair shops in Bagre, Antioquia. It has a fleet of ten boats, and moves about 200 people daily around its gold digging operations.

MEXICO—*Cia Minerales Mexicanos, S.A.* is preparing to exploit the rich tungsten, lead, and zinc deposits it has under concession at Cañada Honda, Otates, and Loma de Caballos, near Leon Guanajato.

BOLIVIA—The *Coro-Coro* copper property of the *American Smelting and Refining Company* is meeting with serious labor troubles. Production has been reduced considerably and it is rumored that the property may be closed down if authorization can be obtained.

CHILE—The first thousand tons of smelted copper produced by the new Chilean government plant at Paipote has been shipped to Western Germany.

ARGENTINA—A survey party has returned from the fluorspar deposits of Valcheta in the Territory of Rio Negro. They report that fluorspar-bearing zones extend over 100 meters in length with

widths to 7 meters. The average grade is over 98 percent CaF_2 in some places and geologists estimate that up to 100,000 tons of ore may exist there.

MEXICO—Iron ore reserves are estimated at 222,000,000 tons by the extraction industry's department of the Ministry of National Economy, and at 341,000,000 tons by the permanent committee of industrial planning of the National Transformation Industry Chamber. Calculating Mexico's full annual demand for iron ore at about 400,000 tons, the Ministry estimates the reserves will last 555 years. The Chamber, figuring national yearly needs at 600,000 tons, sees these reserves lasting a mere 370 years. Both groups agree that iron ore exploration should continue as it wards off possible shortages resulting from great expansion of the Mexican steel industry.

BRAZIL—Reserves of phosphates are estimated at 150,000,000 metric tons by Brazilian Professor Othon Leonardos who surveyed only deposits of importance. *Quimbrasil-Serrana* is working apatite beds near Jacupiranga on the Sao Paulo coast. Mills there are turning out about 20,000 tons of fertilizer yearly. A main drawback is high transportation costs. Construction of a good road would reduce the company's cost by about 25 percent, according to officials of the firm. Quimbrasil-Serrana is planning to produce 65,000 tons of fertilizer a year as soon as new machinery, now installed, begins operating.

COLOMBIA—The asbestos deposits around Yarumal in the north central part of the Department of Antioquia are being opened up in order to furnish material for the local roofing industry.

BRAZIL—Brazilian technicians are reported to be very interested in the cobalt mineral, asbolite, found intimately associated with the manganese-nickel ore of Niquelandia in the state of Goiás. Some asbolite mined by the company which owns the concession—*Companhia Niquel de Tocantins*—was sent to the United States for study. The cobalt to be produced in the near future will be used mostly by the *Companhia Aços Especiais Itabira* in the state of Minas Gerais.

OCEANIA

QUEENSLAND—The huge reserves of *Mount Morgan, Limited*, Australia's big gold and copper mine in the northern state of Queensland, are indicated in the latest annual report of the operating company. The estimate is 15,314,000 tons which includes 6,850,000 tons of ore at the mine's Sugarloaf area. Total reserves are believed to contain 2,072,879 ounces of gold and 155,038 tons of copper. During the year, 864,900 tons of ore were treated with a recovery of 66,070 ounces of gold, and 4,694 tons of copper. The directors state that the rising trend of costs has already overtaken the additional revenue from the increased price of copper.

PHILIPPINE ISLANDS—A *Philippine Rehabilitation Finance Corporation* loan of Pesos 1,100,000 is assisting *Mareman & Company, Inc.* to rehabilitate the property of *United Paracale Mining Company* which it controls. The mine has been dewatered and production is scheduled to begin shortly.

PHILIPPINE ISLANDS—Production of the *Atok Big Wedge Mining Company* totalled 13,251 tons during December 1951, valued at Pesos 243,063. This brings total production for the year up to 171,327 tons, valued at Pesos 3,407,134, based on gold at 70 pesos or $35.00 per ounce. The actual receipts for production were substantially higher than this figure, however, as gold continues to sell in the open market at substantial premiums—the last price being Pesos 117 per ounce. Under Philippine laws the mining companies are permitted to sell 75 percent of their production on the open market.

NORTHERN TERRITORY—Copper mines in the Pine Creek area are reported to be lying idle because there are no smelters in the district to treat the ore. Some mines are said to have ore assaying 30 percent copper. Others are mining wolframite and abandoning rich copper lodes.

NEW SOUTH WALES—At Rye Park, *Tungsten Consolidated Ltd.* has

taken an option on a tungsten deposit. The company's present mine is at Frogmore 17 miles from Rye Park. *Zircon Rutile Ltd.* has installed a new concentrator in place of its No. 1 unit. Improvements made in its No. 2 concentrator have permitted increases in the tonnage treated up to 50 percent. A small plant has been erected for the manufacture of chemicals from the company's products.

PHILIPPINE ISLANDS—*Lepanto Consolidated Mining Company* established a new production record during December when its monthly production value exceeded Pesos 3,000,000. This was partially due to increased production but mostly to higher prices received for its copper in the world market. During that month, Lepanto milled 32,218 tons with receipts valued at Pesos 3,087,783, including adjustments on previous shipments. This brings the company's 1951 production to Pesos 16,650,328, compared with Pesos 10,877,006 in 1950.

WESTERN AUSTRALIA—*Central Norseman Gold Corporation N.L.* is carrying out development work at the *Phoenix* and *Princess Royal* mines. Last year the company treated 153,928 long tons for a yield of 41,629 ounces of gold and 40,536 ounces of silver. Two-thirds of this tonnage was drawn from the Phoenix; the majority of the remainder came from the Princess Royal, and a small amount was contributed by the *Lady Miller* mine.

PHILIPPINE ISLANDS—Late in 1951, two new mines went into production. *Coco Grove* is a placer operation which produced Pesos 38,063 for the month of November. The *Itogon Mining Company* milled 9,500 tons with a gold production valued at pesos 229,609. *San Mauricio Mining Company* is scheduled to go into production shortly.

SOUTH AUSTRALIA—Present plan of S.A. *Barytes Ltd.* is to double output from its barite mine at Oraparinna near Hawker to 7,000 tons per year and to use a Diesel road train for ore transport. The company has operated the mine which is located at the head of Spencer's Gulf since 1947. In the old Moonta field on Spencer's Gulf, a new company has been formed to reopen the *Poona* copper mine— the *New Poona Syndicate 1951.*

PHILIPPINE ISLANDS—While no shipments of chromite were made during November, *Acoje Mining Company* shipped 7,000 tons of chromite valued at Pesos 330,523 during December. During that same month, *Consolidated Mines* produced 30,390 tons of chromite, having a value of Pesos 790,140. This brings the annual production of Consolidated to Pesos 7,586,410, derived from 301,835 tons.

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ENGINEERING BOOKS:

Views and Reviews

PRINCIPLES OF GEOLOGY, By James Gilluly, Aaron C. Waters, and A. O. Woodford. W. H. Freeman & Co., San Francisco. 640 pp. $5.75.

The authors have achieved with signal success their purpose of presenting to the student of geology a summary of geologic knowledge The approach is new; the book is not, nor is it intended to be, a collection of factual data but rather it is an informative and interesting story of geology and the fascinating aura that has surrounded the study of the earth. Though Gilluly, Waters, and Woodford have written for the student, the book is worthy of the attention of the most advanced geologists. The alternating acceptance and rejection of the many controversial subjects that abound in geology present a serious problem to the operating geologist. Here the authors have clearly and concisely presented a consensus of the present status of such theories as continental drift and granitization.

SYSTEM OF MINERALOGY, Vol. II. By J. D. Dana, C. Palache, H. Berman, and C. Frondel. John Wiley & Sons, Inc., New York, New York. 1951, 1124 pp., cloth bound, numerous drawings of crystals. $15.00.

This is the second of three volumes of the seventh edition of Dana's *System of Mineralogy*. It has been entirely rewritten and greatly enlarged. Volume II covers the halides, nitrates, borates, carbonates, sulphates, phosphates, arsenates, tungstates, molybdates, etc. The principal changes in the addition include: a new mineral classification based on crystal chemistry, a new elastic series of classification numbers for species, a new form of presentation of the crystallographic data, revision of specific gravities based on new observations, a new method of treating minerals that form a so-called series and a description of the series as if it were a single species description, and expansion of the reference section to include sources of data.

ARIZONA ZINC AND LEAD DEPOSITS NO. II. Eldred D. Wilson, Geological Series No. 19, Bulletin No. 158, Arizona State Bureau of Mines, Tucson, Arizona. Free to Arizona residents.

The new bulletin describes 12 zinc and lead districts in the state—Gleeson-Courtland, Abril-San Juan, Swisshelm, Huachuca (Hartford), Golden Rule, Oro Blanco (Ruby), Empire, Bunker Hill, Banner, Castle Dome, Silver, and Eureka.

Copies of any of these books may be purchased from *Mining World*, 121 Second Street, San Francisco.

PRODUCTION EQUIPMENT PREVIEW

This section makes Production Economies and increases Production Potential Earning Power possible

Production Equipment Preview thru a Practicable, Efficient Products that offers

Jumbos By Rogers Iron Works Go Into Action

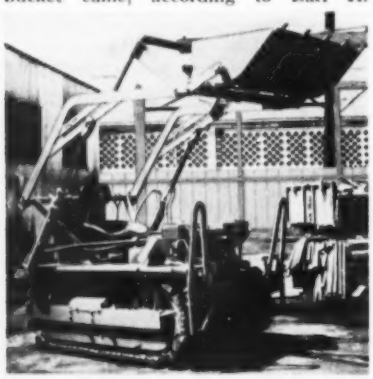
Pictured is one of two Rogers Jumbos placed in operation at an underground iron ore mine in Missouri. Each of the Jumbos has two hydraulic jib arms with

self-leveling operator's platforms, independently driven tracks, mast platform adjustable at any height and electric motor drive.

Other Rogers jumbos are available with stationary masts, pivoted booms, jib arms mounted directly on the crawler chassis and with air or Diesel engine drive. They are used for drilling, powder loading, scaling, roof bolting and timbering. All models may be easily disassembled for entrance through mine shafts. A bulletin is available on the new Rogers Jumbos. Circle no. 68.

Hydraulic High Lift Bucket for Agricat

A new high lift hydraulically-operated front-end bucket, designed expressly for the new long track Agricat, has been put on the market by the Earl H. Pence & Company, Inc., San Leandro, California. Development of the high lift bucket came, according to Earl H.



Pence, company president, "as a result of public demand for additional implements for light earth-moving operations."

The Agricat, available either on standard steel tracks or on rubber tracks, is a midget-sized (six feet long) tractor which has achieved nationwide recognition for its ability to perform satisfactorily in places that restrict the use of larger tractors.

The high lift bucket lifts to a height of 68 inches from the ground level, and is capable of being lowered 4 inches below track level.

Detailed information is available from the company or through MINING WORLD by circling no. 69.

New Caterpillar Booklets Cover Diesel Maintenance

A cartoon story presented in "Maintenance Guide," a 28-page, four-color service booklet published by Caterpillar Tractor Company features a dealer's serviceman who shows how ". . . good maintenance will add many hours of top performance to your engine."

The booklet is the first of a series dedicated to proper equipment maintenance.

Full discussion is given to cooling, lubricating, air intake and exhaust and fuel supply systems. Also included are care of starting engines, marine gear, and generators, along with cold weather hints and general facts.

Copies of the booklet, Form 30246, are available from Caterpillar Tractor Company, Peoria, Illinois, or by circling no. 70.

Revolutionary Method Makes Dry Photocopies

A remarkable new invention actually revolutionizes modern photocopying. This new machine makes it possible for the first time to produce dry photocopies of anything almost instantly. The Auto-Stat is based on an entirely new principle of instant and automatic developing and fixing. It enables anyone—without training or special skill—to produce clear black and white photo-exact copies of any original in any office.

A finished copy can be made in less than 30 seconds and the machine occupies no more space than a typewriter. It can actually operate on a part of a desk top. The Auto-Stat requires no darkroom, no special running water set-up, no exhaust pipes and creates no ammonia fumes.

There are no limitations to the type of papers, documents or originals that can be copied on the Auto-Stat regardless of whether the original is printed on one or both sides or on opaque or translucent paper. Circle no. 71.

Radioactivity In Human Blood Now Detectable

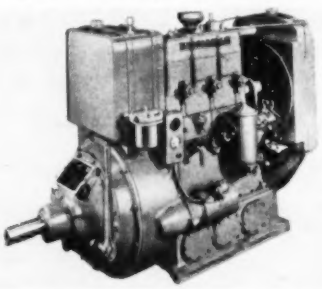
A supersensitive radioactivity detection instrument called the "Scintillometer,' which is so sensitive to radioactivity that it will detect the minute radioactivity normally present in blood, was demonstrated by a nuclear scientist of the Radiac Company located at 42nd Street & Fifth Avenue, New York City, the first atomic instrument department store in the world.

Previously radioactivity in the blood could only be detected after hundreds of gallons were concentrated and exposed to a special type of Geiger Counter. The Scintillometer was shown to detect radioactivity of the blood stream by simply holding it close to the body.

James Mitchel, atomic physicist of the Radiac Company, stated, "The Scintillometer was originally developed as a supersensitive detector to prospect for uranium from a low-flying airplane." This instrument is about 300 times as sensitive as the Geiger Counter and is used in preference to the Geiger Counter to probe at far greater depths for precious radioactive deposits, which are vital to our atomic preparedness. Circle no. 75.

Versatile New 3-Cylinder Diesel Made by Nordberg

The addition of a new, three-cylinder Diesel engine, conservatively rated at 30 to 45 horsepower within a speed range of 1200 to 1800 rpm, is announced by



Nordberg Manufacturing Company. The new power unit, supplementing the Nordberg 4FS one- and two-cylinder Diesels, was developed to meet the need for low cost, compact, heavy duty engines in the small horsepower field.

Built as a complete, self-contained, ready to operate unit, it is available as an electric generator set, pumping unit, and clutch-equipped or stub shaft power take-off (as illustrated) for direct connection or belt drive. Circle no. 72.

INGENIOUS ORE CAR MOVER: Having trouble with underground ore car transfers? Save time and money with American Mine Door Company's new Canton Car Transfer. It enables the operator to load continually while filled cars are being transferred to the rear of the train, it requires two men only two minutes to spot it anyplace on the track where side room permits, and it will hold cars up to 6 tons. Get the new descriptive folder on this money maker by circling no. 2.

GEAR DRIVES: Link-Belt Worm Gear Drives of three basic types, each available in 10 different sizes, for fractional or large horsepower, and in speed ratios of 3⅝ to 1 up to 8,000 to 1, are illustrated in a new 80-page Book No. 2324. Circle no. 3.

LOADER: The Joy Manufacturing Company 18-HR-2 loader, designed for high-capacity tonnage in metal and non-metallic mines, is described and illustrated in a new bulletin. Bulletin No. J-108. Circle no. 4.

ACID-TANK LINERS: Completely welded, chemically inert, Polyethylene tank liners are now offered by the American Agile Corporation. They are available with drains, overflows, flanges, valves, and fittings thaat permit direct connections to other existing pipe lines and installations. Circle no. 5.

TRUCK BODIES AND HOISTS: Complete information on heavy duty Heil bodies for your off-the-road dumptrucks or earth movers, and Heil hydraulic dump-truck hoists will be sent to truckers who circle no. 6. — Dir

POWER TRANSMISSION: Repairs, replacements, and new installations involving power transmission equipment require experience. The Falk Corporation has compiled a bulletin based on over 30 years of work in the mining field that will prove invaluable to operating miners. For your copy, circle no. 7.

HOISTING EQUIPMENT: A new bulletin by the Vulcan Iron Works describes various types of hoisting equipment, including tables showing rope capacities for drum diameters ranging from 9½ inches to 120 inches and tables for calculating rope pull on slopes and inclines. Circle no. 8.

MAGNETS CATALOG: A 12-page catalog on the entire line of Dings magnetic separators and lifting magnets tells which magnets to use to remove iron form wet or dry materials carried on conveyor belts, as well as from chutes, ducts, etc. For a copy of the booklet, circle no. 9.

MILL EQUIPMENT: The Hardinge Company has published a bulletin that describes their complete line of classifiers, conveyors, feeders, filters, etc. To obtain this bulletin, circle no. 11.—Dir

PIPING POINTERS: Due to the demand for the last edition of "Piping Pointers" published by the Crane Company (250,000 requests were received), a bigger and better edition has been compiled. The book is designed to be a helpful handbook for training maintenance workers. It thoroughly covers all the fundamentals of good, sound piping practice with facts and well-illustrated "how-to-do-it" explanations. For a copy of this publication, circle no. 13.

THICKENERS: The Dorr Company has released a 28-page bulletin in color that covers the major types of Dorr thickeners with text, drawings, photographs, and size ranges. Control devices, special designs and the company's engineering service are explained in detail. For a copy of this informative booklet, circle no. 15.

HARD-FACING ALLOY RODS: The Victor Equipment Company has announced the publication of five new bulletins on their line of tungsten carbide rods for electric or acetylene application. To obtain these informative releases, circle no. 16.—Dir

LIFT TRUCK: Engineering changes in Hyster's model 20 lift truck now permit more versatile use of this popular truck and solve the old problem of carrying around heavy counterweights not needed for average jobs. The truck owner can select the proper counterweight for a particular type of operation. For further information circle no. 17.

SELF - PRIMING CENTRIFUGAL PUMPS: The Ingersoll-Rand Company has introduced a new line of self-priming centrifugal pumps intended for pumping applications under suction lift where the presence of air or vapor makes it impractical to use the conventional centrifugal pumps. Circle no. 19.

ARC WELDING BULLETIN: The International Nickel Company has made available a 19-page bulletin on nickel-molybdenum-vanadium alloy steel shielded arc welding electrodes (low hydrogen type) by three welding specialists of the Philadelphia Naval Shipyard that summarizes results obtained with commercially available rods. The welds produced consistently exceeded 110,000 psi yield strength with maximum ductility. Operating characteristics, welding procedure and the importance of low moisture content in the electrode coating are described. To obtain this bulletin circle no. 20.

NEW THROWAWAY BITS: The Mackintosh-Hemphill Company recently announced a new line of forged steel disposable bits in sizes from 1¼ inches to 2⅜ inches. They claim for the new bit the ability to drill faster with a cleaner, smoother hole and longer bit life. For more information on this new bit circle no. 22.

FUSION WELDING BOOKLET: A complete 44-page technical treatise on the fusion welding of nickel and high nickel alloys has just been published by the International Nickel Company. In addition to detailed welding instructions, the booklet covers the boiler code of the American Society of Mechanical Engineers, pickling, testing and inspection safety methods. For a copy of this work, circle no. 23.

RESISTANCE WELDING: A new technical booklet on the resistance welding of nickel and high nickel alloys has been issued by the International Nickel Company. It presents tables on mechanical properties, chemical compositions, recommended conditions for welding and other information. Circle no. 24.

EARTH MOVER: A new 16-page catalog describing their high speed, rubber-tired, self-propelled earth mover has just been released by the LaPlant-Choate Manufacturing Company. Circle no. 25.

PUMP BULLETIN: A new bulletin describing Freeflo pumps for sump, sewage, and drainage service, has been announced by the Worthington Pump and Machinery Corporation. Among the units non-clogging impellars capable of passing included are wet-pit pumps that have solids and stringy material. For a copy of the bulletin, circle no. 40.

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To get further information on any item described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

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DUST RECOVERY: Buell Engineering Company has a new bulletin on "The Collection and Recovery of Industrial Dusts." The 28-page book has complete information on systems of recovery that will boost plant yield, improve product and process, and eliminate air pollution. For a copy, circle no 26. — Dir.

SHOVEL CATALOG: A new catalog on their Model 2000, 25-ton crane and 1¼-yard shovel has been released by the Manitowoc Engineering Works. Featured for mining is a 26-foot high-lift shovel attachment. Circle no. 29.

LOW COST MATERIALS HANDLING: Pioneer Continuflo equipment is successfully extending the lives of many old mines on both the Mesabi and Cayuna ranges in Minnesota by profitably handling low grade ores. For further information on the line of feeders, screens, crushers, and conveyors produced by the Pioneer Engineering Works, circle no. 30 on the PEP card.

CENTRIFUGAL PUMPS: A new bulletin describing the function, sizes and capacities of their centrifugal pumps has just been issued by the Morris Machine Works. To obtain a copy of this handy, pocket-size reference, circle no. 31.

SUPERCHARGED ENGINE: The design, operation, and engineering data on the Supairthermal engine are presented in a 12-page bulletin published by the Nordberg Manufacturing Company. The new engine produces, in any given size, one-third more horsepower than the conventional turbocharged engine and is available in four-cycle types for Diesel, Duafuel and spark-fired gas operation. Circle no. 32.

MICROFILM: In modern office record-keeping systems, microfilming processes are playing an increasingly important role. These processes can be used to advantage in engineering offices, sample departments, and shipping departments. Large volumes of valuable materials can be permanently and quickly reproduced and stored in small, fire-proof vaults. Complete information will be furnished through Remington Rand by circling no. 33.

FLOTATION MACHINES: The Western Machinery Company has published a bulletin that describes their flotation machines with all pertinent data included. A must for millmen. Circle no. 39.

WELDING PRODUCTS: The Taylor-Wharton Iron and Steel Company has issued a 6-page folder on manganese-nickel steel welding products and cast manganese steel point bars and repointers. For a copy, circle no. 35.

SPECIAL TRACTOR TOOLS FOR MINING: Hyster accessories for Caterpillar tractors, including the "Hystaway" ½ yard excavator and a complete line of winches, yarders, cranes, and donkeys. Provides versatile range of uses in mining operations. Complete literature available from MINING WORLD. Circle no. 34. — Dir.

SAND PUMPS: For complete literature on a line of sand pumps specifically designed for pumping sands and slurries in mines, mills, and smelters, write to Allen Sherman-Hoff Co., 223 S. 15th St., Philadelphia 2, Pa., or circle no. 36 on the PEP card.

ROLLER CHAINS: Tension linkages, and numerous examples of uses for roller chain are described, illustrated, and cataloged in a new handbook released by Chain Belt Company, 1600 W. Bruce St., Milwaukee 4, Wis. and written for designers of tension linkages. Circle no. 38 for your copy.

REBUILDING WORN TRACTOR PARTS: To get your copy of an informative new Stulz-Sickles Co. booklet which tells you how to use Stulz-Sickles' tools and Manganal welding rod in the rebuilding of worn idler wheels, drive sprockets, dozer blades, and other tractor parts, circle no. 37 on the MINING WORLD PEP card.

METALLIZING: Vol. 5—No. 11 of the METCO News published by the Metallizing Engineering Company describes in detail methods of stretching your replacement and repair dollars by spray application of various metals including molybdenum, stainless steel, zinc, and aluminum. Circle no. 43.

NEW HOISTS: A new series of hoists, controlled thru oversize hydraulically operated clutches, has been introduced by the King Manufacturing Corporation. External contracting, three-inch band brakes, used in conjunction with automatic safety ratchets, insure safe stopping power. Wide ranges of speeds and capacities are available. To obtain a bulletin describing these hoists, circle no. 45.

NEW FROTHER: Actual mill tests have shown that the newly-developed Dowfroth 250 will give improved recoveries thru a quicker-breaking, livelier froth, lower reagent concentrations than former frothers would permit. For a free sample, mail the coupon on page 19. Readers outside the United States should contact the Dow Chemical Company, Dept. OC 47, Midland, Michigan.

SPECTROSCOPY: Eberbach and Son Company has published a booklet that treats of the history, methods and uses of chemical spectroscopy and includes descriptive material on their line of laboratory apparatus and supplies. For a copy, circle no. 46.

FLEXIBLE TUBING: Spiratube, offered with vinyl plastic coating for inertness to chemicals and oils and abrasion resistance for rough handling, is a new flexible fabric tubing for ventilation and product handling manufactured by the Flexible Tubing Corporation. The new tubing is non-kinkable and its accordion action makes shipping and packing easy. For further information, circle no. 48.

TRACTOR CAB: The Mercury Manufacturing Company has announced a new low-cost, all-weather cab assembly, shipped in knocked-down form to the user and designed for quick installation in the field, for the Mercury line of heavy-duty gasoline tractors. Circle no. 51.

HEAVY DUTY MUCKER: A new bulletin published by the Eimco Corporation tells of the many surface installations that employ the Eimco 104 heavy duty loading machine. If you would like a copy of this descriptive folder, circle no. 59.

HAND HOIST: Complete information on the Lug-All winch hoist and accessories that enable one man to lift one-half ton 30 feet will be sent by the Lug-All Company to those who circle no. 62.

POWER SCRAPER: The Wooldridge Manufacturing Company's new Model TC-S142 Terra Cobra self-propelled power scraper with a heaped capacity of 17.5 cubic yards is described in a new bulletin that can be obtained by circling no. 67. — Dir

For Free Product Literature, see other side

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(including the annual Review and Directory)

NORTH, CENTRAL AND SOUTH AMERICA:	one year $3 two years $5
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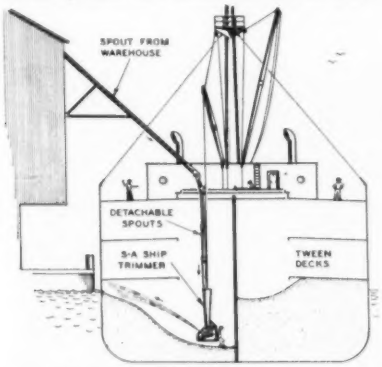
FOREIGN READERS NOTE:

The copy of World Mining you are receiving consists of carefully selected material from the complete American edition of Mining World to which the above subscription rates apply. If you would like to receive the complete Mining World, fill in the lower section of the reverse side of the card at the left. The card must carry proper postage if mailed from a point outside the United States. You may send payment or be billed later.

Efficient Ship Trimmer Saves Loading Costs

Stephens-Adamson ship trimmers are in operation at ports all over the world to load materials uniformly and rapidly into the holds of ocean going vessels. Loading time has been cut in half and

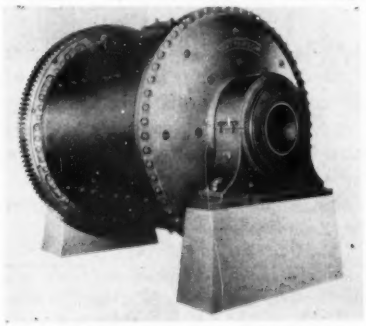


manual attention reduced to only a fifth of the amount demanded by other loading methods. Capacities range up to 1,500 tons per hour, depending on the type of material handled and the size of the trimmer belt.

Material chuted to a high-speed belt is hugged closely to it by centrifugal force and quickly attains the belt speed of 2,700-feet per minute. For most materials this speed carries it well over 50 feet from the trimmer. A gear mechanism enables the operator to tilt the stream of material from the belt through a vertical arc. Variable belt widths and lengths are available for specific capacity requirements. For more details and photographs of actual installations, write Stephens-Adamson in Los Angeles for bulletin 951 or circle no. 73.

New Ball and Tube Mill Proves Highly Adaptable

Development of a new heavy duty continuous ball and tube mill has been announced by the Patterson Foundry



and Machine Company of East Liverpool, Ohio. Improved mechanical features of the mill insure economical and reliable continuous grinding operation under the most severe conditions, with costly shut-downs being entirely eliminated and maintenance expense reduced to a minimum.

Adaptable to fine or coarse grinding, wet or dry, in open or closed circuit, the new Patterson mill is an important development in the mineral dressing fieid. A descriptive bulletin on the mill can be had from the company or through MINING WORLD by circling no. 74.

Free Book Released Rubber in Mining

The British Rubber Development Board has just announced the free distribution of a new book dedicated to saving mining costs. Titled, "Rubber in Mining," the book was prepared by two noted British mine authorities, A. V. Paull and J. Gallaway of the Royal School of Mines, Camborne, Cornwall.

Every effort was made to make this a working handbook for the practicing engineer, with special emphasis being devoted to those applications of rubber which help cut mining costs. With 97 pages and 67 pictures, the authors have thoroughly covered four phases of the mining industry—the properties of rubber and its use as an engineering material; the applications of rubber in exploration and rock breaking; the applications of rubber in transport; and rubber in the treatment plant.

"Rubber in Mining" is an excellent working tool for every mining company and engineer. It may be obtained without cost from the Natural Rubber Bureau, 1631 K Street, N.W., Washington, D.C., or by circling no. 80 on the Pep card.

New Mastic Flooring Uses Mineral Uintahlite

A new process has been developed in the manufacturing of industrial mastic floors in which Uintahlite, a natural mineral product, is used for the first time.

Uintahlite, much valued and widely used as a stabilizer and strengthener, is generally grouped as a form of native

asphalt but technologists, because of its different and unusual properties, classify it as something different than the asphalt or bitumens that range from liquid to solid form, whether natural or processed. It does not soften in the hottest sun, it does not weather or dissolve in water. It has uncommonly high resistance to corrosion by acids and alkalis, liquid or gaseous. Uintahlite is found only in the great 8,000 square-mile Uintah Basin in Utah and Colorado.

The Flash-Stone Company devised a method that now enables the use of it in a combination resulting in greatly increased stability and compressive strength in their Texas Jack Resurfacer or high-density complete mastic flooring. For further information, circle no. 77.

Plastic Pipelines Being Installed for City Use

The little mining community of Pax, West Virginia, is reportedly the first corporate city in the United States to use plastic pipe in the installation of a municipal water supply and distribution system.

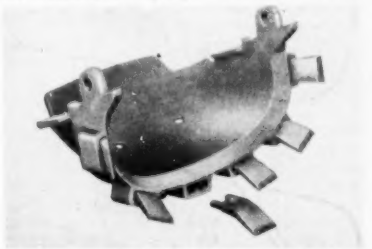
"Other small towns—particularly mining communities—probably will be interested in our experience," said Frank Wriston, who was mayor of Pax when the project was undertaken.

"While plastic pipe has been used extensively in mines, the Pax project is, to the best of our knowledge, the first instance of the product's use in a city waterworks," stated Charles A. Ebner, general manager of the Yardley Plastics Company, manufacturers of the pipe.

A second new use is the huge vinyl plastic-lined sewer pipe nearly seven miles long and over two yards in diameter being installed in Orange County, California. The reinforced concrete pipe is lined with "T-Lock Amer-Plate," a plastic sheeting developed and manufactured by Amercoat Corporation.

Parsons Designs Time-Saving Bucket Tooth

The development of tap-in bucket teeth as standard equipment on all sizes of Trenchliners has been announced by the Parsons Company of Newton, Iowa.

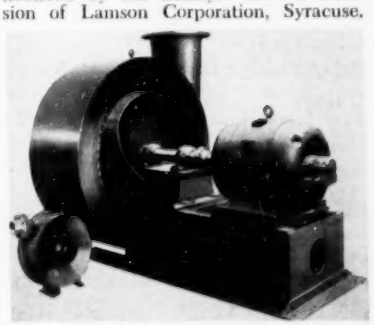


The principal feature of the self-locking tooth is the "easy-in-easy-out" time saving replacement involved.

Tap-in teeth eliminate the need for bolting or crimping edges to hold teeth in position. A precision taper locks the heat-treated, high-grade alloy steel tooth firmly in place either on buckets or side-cutter bars. Sturdy tooth holders are integrally cast with the bucket lip for positive tooth support. By welding adapters to the buckets, Trenchliners of any age can be converted to use tap-in teeth. Write to the Parsons company or circle no. 76.

Larger Steel Fabricated Blowers Now Available

A new line of fabricated steel blowers—limited in size only by available manufacturing space—has been announced by the Billmyre Blower Division of Lamson Corporation, Syracuse.



Standard models in the new line range up to 200 hp. Latest steel cutting and continuous welding methods enable the new line to offer weight saving and space economy not heretofore feasible in cast blower construction. The same features of durability, simplicity and efficiency are preserved.

Literature, specifications and dimension sheets are available through O. W. Acheson, Billmyre Blower Division, Lamson Corporation, Syracuse, New York, or by circling no. 78.

RESULTS SHOW:

"DuPont 'MS' Caps do a better job..."

IMPROVE FRAGMENTATION

REDUCE CONCUSSION

INCREASE SAFETY

More and more ore mine operators are using Du Pont "MS" (Millisecond*) Delay Electric Blasting Caps. These short-interval delay caps consistently do a better job than regular electric blasting caps, long-interval delays or caps and fuse.

IMPROVED FRAGMENTATION. Good reason for their popularity is that "MS" Delay Caps are an important factor in producing superior breakage of the ore. This helps increase production . . . reduce costly hand labor, blockholing and chute blasting. And, "MS" Delay Caps often permit the use of less explosives per ton of ore mined.

REDUCED CONCUSSION. An outstanding advantage of "MS" Delay Caps lies in reduced concussion resulting in less damage to pillar walls and timber.

INCREASED SAFETY, always an important factor, is still another benefit. The short intervals of "MS" Delay Caps eliminate the possibility of dynamite in the muck. Like all Du Pont electric blasting caps, "MS" Delays are made with waterproof rubber-plug closures, aluminum-foil-shielded shunts and plastic insulated wires.

Why not try Du Pont "MS" Delay Electric Blasting Caps in your own mine . . . see for yourself how they can help do a better job? Ask the Du Pont Explosives representative in your area for complete information about these short-interval delay caps. He's always glad to help with your blasting problems. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

• • •

**Available in 14 millisecond delay intervals MS-25, -50, -75, -100, -125, -150, -175, -200, -250, -300, -350, -400, -450 and -500.*

DU PONT

REG. U. S. PAT. OFF.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Utah Firm Reports On Uranium-Vanadium Ore

Consolidated Uranium Mines, Inc. continues to be one of the largest miners and shippers of uranium-vanadium ore in Utah. C. A. Elggren, secretary-treasurer, has reported that from August 1950 to October 1951, 20,034 dry tons of ore were shipped to the United States Atomic Energy Commission's Monticello, Utah custom mill. The ore was mined on the company's 39 claims in the Temple Mountain district of Emery county. In addition to company ores, Consolidated shipped lessee ores and ore mined by its affiliate, Continental Mining and Milling Company. Gross value of ore was $440,678. Uranium was valued at $204,367; vanadium at $69,185; AEC development allowances at $39,510; and haulage allowance at $122,373.

An extensive program of surface drilling is to be expanded in the near future. To date, more than 45,000 feet of wagon drilling, with holes to a depth of 100 feet, have been completed, and 40,000 feet are scheduled with some holes to a 200-foot depth. First ore is now being shipped to the Vitro Chemical Company's Salt Lake City plant under terms of a recently signed contract.

E. G. Frawley of Salt Lake City is president and general manager; the directors include Roy Hardy of Reno and Nolan Krogue.

Golden Cycle Cuts Lessees Cripple Creek Royalties

The Golden Cycle Corporation has inaugurated a new and lower royalty schedule for lessees at its Cripple Creek Colorado gold mines, according to Max W. Bowen, vice president and general manager. Under the new schedule, ore valued up to $17.50 per ton will have a royalty of 7.5 percent, that from $17.50 to $35.00 a royalty of 12.5 percent, with a gradual increase to a royalty of 30 percent for all ore worth $87.50 per ton or higher.

A flat 10 percent royalty will apply to all dump lessee's shipments. In addition to the graduated royalties, a one-percent royalty on the gross value of all shipments will be deducted to pay the lessee's share of the production and other taxes. The new schedule in no way effects the split-check system of leasing long used in the Cripple Creek district.

COLORADO

Telluride Mines, Inc. has completed installation of a new 100-ton-per-hour crushing plant at the portal of its mill level tunnel at Pandora, San Miguel county, Colorado. The new crushing plant with its 1,200-ton fine ore storage bin is an important addition to Telluride Mines' streamlining program to reduce costs of ore transportation and treatment. Only one crushing shift per day is now necessary, as compared with three in the old plant. Ore from the mine's upper levels is now transferred to the mill level through the recently completed ore transfer raise and then trammed directly to the new crushing plant. C. Parker, Jr., general manager, planned the new plant.

Work at the Meldrum Tunnel of the *Idarado Mining Company* above Pandora, San Miguel county, Colorado, has been delayed by a series of snow slides which closed the road to Telluride and made it impossible for men to reach the tunnel. William Nelson of Telluride supervises Idarado's operation at Telluride. Work continues without interruption at Idarado's new deep-level "Bobtail" crosscut adit. It is about 400 feet lower than the Meldrum Tunnel and will be driven to cut the Ajax and Argentine veins. Idarado has large holdings in San Miguel-Ouray counties and is mining 800 tons of gold-lead-zinc-silver-copper ore per day from the Black Bear vein through the Treasury Tunnel.

The *Dulancy Mining Company*, one of the largest independent uranium-vanadium producers in Colorado, has moved its main office from Cortez to Grand Junction, Colorado. The company operates mines in the Slick Rock and Horse Mesa districts of San Miguel county, Colorado, purchased about a year ago from F. A. Sitton of Dove Creek. It also operates roscoelite mines on Barlow Creek north of Rico, Colorado, and controls extensive areas on Tenderfoot Mesa, Mesa county. R. O. Dulaney, Sr., is president of the company, as well as vice president of the White Canyon Mining Company which controls 80 claims in the White Canyon district, San Juan county, Utah. Louis P. Gaggini is mine superintendent of the companies' mines and directs the work of more than 100 miners. R. O. Dulaney, Jr., and Charles H. Dulaney are vice presidents; and Thomas E. Potts is secretary-treasurer.

The *Resurrection Mining Company* has extended the mining area it controls in the Leadville mining district, according to Barney Greenlee, assistant manager. The latest acquisition of mining claims has been the leasing of the *Louisville* and adjoining claims from W. E. Reynolds. Resurrection has held a minor interest in the claims for some time. The Resurrection is rehabilitating the White Caps shaft for operations in the area. A new hoist will be installed and a pumping plant on the fifth level will be used to pump all water from the mines below the Yak tunnel level to the tunnel. Two headings are being double-shifted on the fourth level to speed development while some ore is being stoped on the second and third level.

The *American Smelting and Refining Company* has leased the *Robert Emmet* shaft and surrounding claims in the Leadville, Lake county mining district, Colorado, from the *Empire Zinc Division* of the *New Jersey Zinc Company*. ASARCO plans to unwater the shaft be-

HOMESTAKE LEADS STATE IN OUTPUT

The Homestake mine at Lead, South Dakota, was again the largest producer of gold and silver in the state during 1951. It operated continuously during the year, treating about 3,000 tons of ore a day. Construction of a crushing plant is in progress at the Ross shaft and at the Yates shaft which is shown above. The total value of gold and silver produced in South Dakota in 1951 was $16,470,227, as compared with $20,008,436 in 1950. A shortage of miners was said to be the chief reason for the decline in production.

low the Leadville drainage tunnel (elevation 9,975 feet) and conduct an exploration campaign below the tunnel.

Paragon Mines Company is installing a new mucking machine to speed reopening of its *Matterhorn* mine near Ophir, San Miguel county, Colorado. The company has been reopening the No. 5 level but was slowed by spiling through caves. Drifting around the caves in the footwall of the vein will be speeded with the mucking machine. Otto Beselods is manager.

Randy Belisle, Stanley Reed and Cecil Crandall are operating the *New Dominion* mine near Ophir, San Miguel county, Colorado. The men also operate a small mill to make a concentrate from the lead-silver-copper ore.

Uranium mineralization has been discovered in Ouray and San Juan counties, Colorado, mines by Dr. Wilbur S. Burbank and C. T. Pierson, geologists of the *United States Geological Survey*. The Ouray discoveries were made in the *Bachelor* and *Syracuse* lead-zinc-silver mines north of the town of Ouray, and in the black slates of pre-cambrian age south of the town near Bear Creek Falls. The Red Mountain "chimney" deposits were also found to contain uranium minerals. These deposits are in San Juan and Ouray counties and the uranium was found on mine dumps and in small veins in association with high-grade silver in several of the mines.

The *La Salle Mining Company* is operating its uranium-vanadium mines in western Montrose county, Colorado at capacity, according to Matthew P. Rowe, general manager. The company is operating the deepest underground mine in the area and mining the largest tonnage of ore through one shaft. Automatic hoisting in a skip enables the company to produce at capacity. All ore is shipped to the Uravan, Montrose county, salt roast-acid leach plant of the *United States Vanadium Company* for processing. Jess Allen is La Salle mine foreman.

The *Poston Mining Company* is operating its *Brown Derby* lepidolite-beryl mine on Quartz Creek, Gunnison county, Colorado, and the *Cotopaxi* base metal mine one mile north of Cotopaxi, Fremont county, Colorado. The Cotopaxi mine is producing lead-silver-zinc-copper ore.

The *Chemical Corporation of America* has started operation of its 200-ton-per-day pilot flotation plant at Sulphurdale, Beaver county, Utah, according to C. R. King, consulting engineer. The sulphur ore averages about 25 percent S and is mined from an open pit. Diamond drilling has indicated substantial reserves and if pilot plant operations prove successful construction of a larger plant may begin next summer. Sulphur concentrate is being shipped to manufacturing plants in California. W. D. Maycock, Sulphurdale, is general superintendent.

The *Kentucky-Utah Mining Company* is shipping copper ore from its mine in the Big Cottonwood Canyon southeast of Salt Lake City. The ore was stoped from the Dixie-Apex vein, according to E. J. Jeremy, company president.

The *United States Atomic Energy Commission* has opened an exploration branch office at 1710 South Redwood Road, Salt Lake City, Utah. E. E. Thurow, geologist for the AEC's Raw Materials Division, will head the office. His staff will include three geologists and one mining engineer. The office and its staff will be charged with the responsibility of expediting exploration for uranium in Montana, Idaho, Washington, Oregon, California, and Nevada, as well as those areas outside the Colorado Plateau (carnotite-roscoelite ores) in Utah and Arizona.

The *American Smelting and Refining Company* has taken a 30-year lease on 44 claims in the uranium area of the Marysvale district, Piute and Sanpete counties, Utah. The claims are leased from *Marysvale Uranium Company*, controlled by Marysvale residents. The claims are about 1½ miles east of the producing mines of *Vanadium Corporation of America* and the *Bullion Monarch Mining Company*. Geologic mapping of the claims is scheduled for the summer months and ASARCO will commence limited exploration before July 1st.

The *Bullion Monarch Mining Company* has speeded development at its *Bullion Monarch* underground uranium mine in the Marysvale district, Utah, according to Robert N. Cooper, secretary. The development is under way to delimit the uranium ore found in a vein some 200 feet below the surface and north of the company's large open-pit mine. The vein was located by diamond drilling several months ago, but it was necessary to sink a 60-foot winze from the adit below the open pit and crosscut from the winze to reach the vein.

Parker Field is the name given to the 3,500-foot-long air field built by the *Vanadium Corporation of America* adjacent to its Hite, San Juan county, Utah, uranium mill. The field was named after Leroy Parker, VCA mine and mill superintendent. Following completion of the field, the *United States Post Office Department* awarded an air mail contract to Victor M. Reynolds, manager of the Cortez, Colorado, Flying Service, for air mail delivery to Hite on each Monday, Wednesday, and Friday through February, 1, 1954. This is the third such contract ever awarded by the Postal Department to a private pilot in the United States.

The United States Geologic Survey is using three helicopters to transport surveying and geologic crews into the wild and rugged uranium-vanadium region of southeastern Utah. The helicopters will first be used to transport crews from Moab, Grand county, to topographic stations along the canyon rims of the Colorado and Green Rivers, southwest of Moab. Another area to be reached by helicopter is west of Blanding, San Juan county, between White and Red Canyons.

The *United States Smelting Refining and Mining Company* is extending the Lynch Incline of its *Hidden Treasure* mine in the Ophir district of Utah. A deeper level to be established from the incline will test the downward extension of mineralization found on the present bottom level. Development on the deeper level will probably extend into the adjoining leased *Mono-Kearsarge* property.

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Vistac Oil

UNIT Rock drill-Ingersoll-Rand drifter

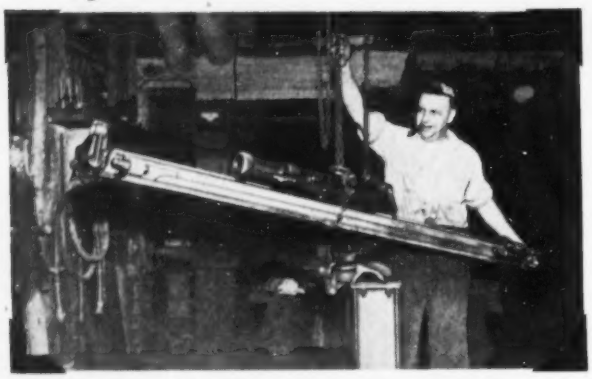
LUBRICATOR Fine oiler

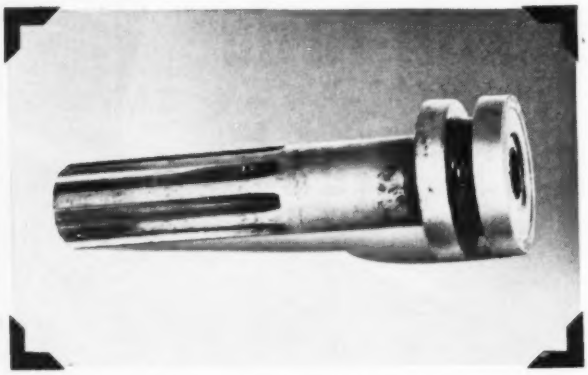
OPERATION Deep underground mining

CONDITIONS High humidity & temp.

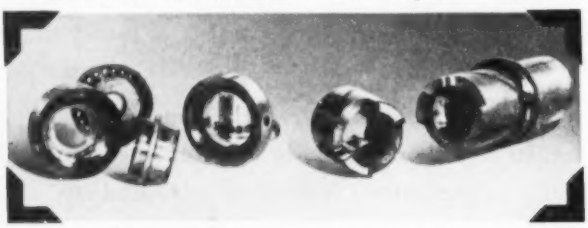
FIRM Sunshine Mining Co., Kellogg, Idaho

Only 0.001 wear on rock-drill piston in 120 shifts!





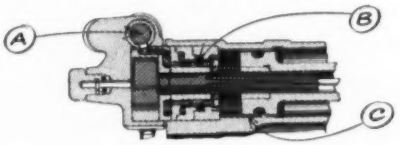
ON THE 3100-FOOT LEVEL of the famous Sunshine silver mine, this drifter, lubricated with Calol Vistac Oil, was in steady service for more than two months before coming in for service. When disassembled by "Drill Doctor" Dave Farnsworth, the piston "miked" only 0.001 inch wear despite the tough conditions in which the drill works. Working face is 400 feet below sea-level. Humidity is around 90 with atmosphere at a constant 75°F. After cleaning, the piston and other parts were put back in service.



VALVE-CHEST ASSEMBLY, chuck and chuck jaw from the drifter. Note the absence of lacquer or corrosion on air-valve parts. Because Calol Vistac Oil has held air-tool wear to the minimum and is approved by the miners, Sunshine Mining Co. has used it for more than 10 years.

REMARKS: Besides providing good air-tool lubrication without excessive vapor or bad odor, Calol Vistac Oil is excellent for heavy-duty plain bearings, reduction gears, motor gear heads, etc. It comes in several grades and may be applied by wick-, ring-, and drip-feed oilers.

How CALOL Vistac Oil cuts costs in air-tool equipment



A. Atomizes quickly and completely—carries evenly over all parts. Does not fog excessively and has no unpleasant odor.

B. Additives help form tenacious, oily, pressure-resistant film in wet or dry conditions—cuts wear and power loss. Small quantity lubricates efficiently.

C. Resists high temperatures and oxidation. Stays fluid at low temperatures.

FREE CATALOG: "How to Save Money on Equipment Operation," a new booklet full of valuable information, is ready for you. Write or ask for your free copy today.

CALOL

TRADEMARK "CALOL" REG. U.S. PAT. OFF.

STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA

precipitates—CENTRAL and EASTERN

Mining Companies Cited For Excellent Management

Twelve mining companies were awarded Certificates of Management Excellence for 1951 by the American Institute of Management, a non-profit foundation in New York which is devoted to the study and improvement of corporate organization and management.

Cited for the first time by the Institute were the New Jersey Zinc Company and St. Joseph Lead Company, both of New York. Designated as "excellently managed" for the second time since the annual award was initiated two years ago, were The Consolidated Mining & Smelting Company of Canada, Montreal; Freeport Sulphur Company, Kennecott Copper Corporation, Newmont Mining Corporation, Phelps Dodge Corporation, and Texas Gulf Sulphur Company, Inc., all of New York; Homestake Mining Company, San Francisco; Hudson Bay Mining & Smelting Company, Ltd., Flin Flon Manitoba; Noranda Mines, Ltd., Toronto; and U. S. Smelting, Refining & Mining Company, Boston.

Iron Ore Shipments To Be Greater in 1952

Great Lakes ore carriers are preparing to move 96,000,000 tons of iron ore during the 1952 season and even more in 1953. Last year, ore carriers came within 908,000 tons of their 90,000,000-ton goal. Barring drastic changes in world conditions, 103,000,000 tons may be hauled during 1953.

Shipping companies are preparing for the increase. About 15 new bulk freighters are scheduled to go into service this year, with others being repowered to increase their capacity through faster operation and more trips.

Oliver Iron Uses DM&IR Cars In All-Rail Shipment

The Oliver Iron Mining Company is shipping between 400 and 500 railroad cars of ore daily from its Mesabi Range open-pit mines to United States Steel Corporation's steel plants at Youngstown, Ohio; Pittsburgh, Pennsylvania; and South Chicago, Illinois. Oliver made all-rail shipments during the winter of 1951 to augment normal Lake ore shipments and developed special methods for blending the ore and mixing with sodium chloride to minimize freezing in the cars. At Youngstown the cars are thawed with steam from two steam locomotives of the Bessemer and Lake Erie Railroad.

For the first time, Oliver is loading the ore into 50- and 70-ton ore cars of the Duluth Missabe and Iron Range Railway Company for the all-rail shipment. During the last winter shipping season, standard gondolas belonging to many of the nation's railroads were used for ore shipments.

Calumet & Hecla Consolidated Copper Company has started exploratory mining at its Caledonia shaft in Ontonagon county, Michigan. The area was the first in North America to be mined for copper by the white men. It is said to produce 200 tons of ore per day and is being worked on a two-shift basis.

The Eagle-Picher Mining and Smelting Company will enlarge its research laboratory in Oklahoma to take care of increased work coming from its many mines, factories and plants throughout the country. The new building will conform in appearance and shape to the present building, and will house seven laboratories. Dr. A. Paul Thompson is the director in charge of all research work.

Index maps of the Wisconsin-Illinois-Iowa lead-zinc mining district are now available for inspection. The maps were prepared by the *United States Geological Survey* and the *Wisconsin Geological* and *Natural History Survey*, and cover about 4,000 square miles. Sets are on file in several locations, including the Wisconsin Institute of Technology, Platteville, Wisconsin, and the Illinois State Geological Survey office in Galena, Illinois.

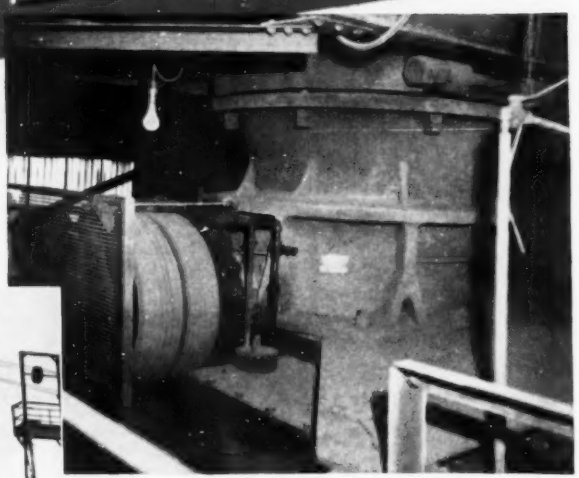
Howard I. Young, assistant administrator of the *Defense Materials Procurement Agency*, recently addressed a group of mine operators in Joplin, Missouri, including members of the *Tri-State Zinc and Lead Ore Producers Association*. While Mr. Young made no promises, he did raise the hopes of the operators by his optimistic view of the metal situation. He pointed out that the DMPA is studying the possibility of some kind of incentive to increase the tonnage production of lead and zinc. When asked whether he thought that the Missouri field could ever come back into profitable production, he replied that he thought it could because the present prices of zinc and lead were high enough to operate the field profitably if these prices could be maintained for a long period of time. He warned, however, that it was economically impractical for the government to give a long-range guarantee.

The Eagle-Picher Company has simplified its corporate structure by absorbing *The Eagle-Picher Mining & Smelting Company*, *Orange Screen Company*, and *The Eagle-Picher Company of Texas*, all of which have been operated as wholly owned subsidiaries. This reorganization is entirely internal in character and does not affect customer relations or stockholder interests. It merely streamlines The Eagle-Picher Company's organization and operation.

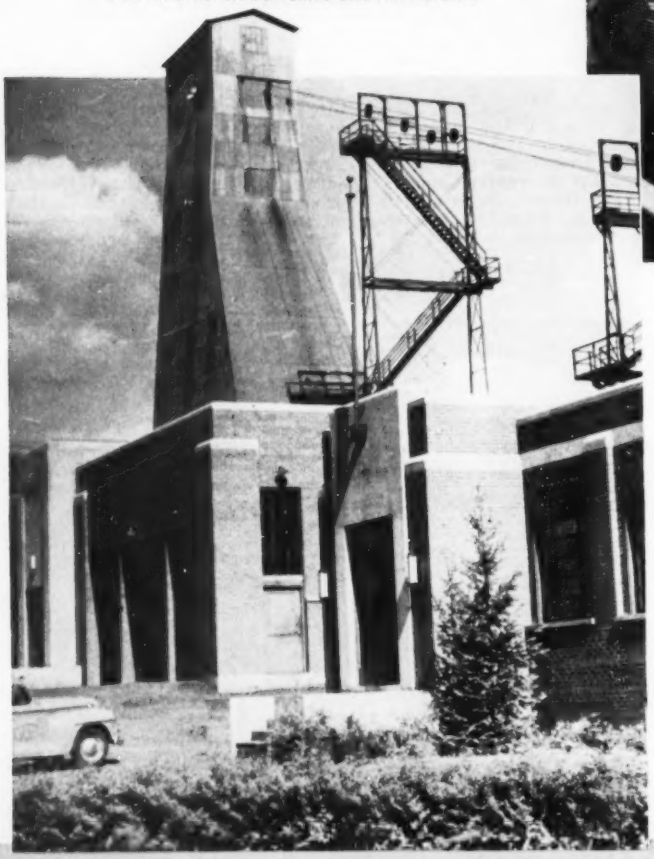
COLONIAL MINE STILL PRODUCES

This open-pit mine near Cornwall, Pennsylvania, has produced magnetite intermittently since Revolutionary War days. The ore body, currently being mined by Bethlehem Cornwall Corporation, is dipping rapidly under the hill. As an open pit, its reserves are limited, but the company is carrying on development work through its No. 3 shaft, and ore will be removed from below the pit level.

OVER 3,000,000 TONS HAVE BEEN CRUSHED by this TELSMITH



The 13-B Telsmith Gyratory Crusher is located in the upper part of the 135-ft. steel headframe shown below.



● An important iron ore producer in the Iron River district of the Menominee Range in Michigan finds his Telsmith Gyratory Crusher to be exceptionally economical.

Installed in 1942, this Telsmith 13-B Crusher handles about 35,000 tons of ore per month, and to date has crushed over 3,000,000 tons. Crusher upkeep expense has been exceedingly low, consisting of only one set of eccentric bearings and some very minor parts. For details on Telsmith's bigger capacity and lower upkeep, get Bulletin 271.

Min.-34

SMITH ENGINEERING WORKS, 4034 N. HOLTON ST., MILWAUKEE 12, WISCONSIN

Mine & Smelter Supply Co. Denver 17, Colo.
Mines Eng. & Equip. Co. San Francisco 4, Calif.
Lee Redman Equip. Co. Phoenix, Arizona
Garlinghouse Bros. Los Angeles 21, Calif.
General Machinery Co. Spokane 1, Wash.
Clyde Equipment Co. Portland 9, Ore. Seattle 4, Wash.
The Sawtooth Company Boise, Idaho
Gordon Russell, Ltd. Vancouver, B. C.

The *E. C. Schroeder Company, Inc.* of McGregor, Iowa, is reported to have acquired an 8,000-acre iron ore deposit at Russellville, Alabama, giving the company a total of 13,000 acres of ore-bearing land. Schroeder already has washing and flotation plants in Russellville; the finished product is shipped by rail to Birmingham, Alabama steel mills. The company is also said to have discovered an iron ore deposit in Minnesota which will be developed in the near future.

The *U. S. Bureau of Mines* has a large exploration program for monazite under way in the Shelby, North Carolina area. Field crews are drilling and a special laboratory has been established for checking samples.

Fairless Works, a new integrated steel mill of *United States Steel Corporation* at Morrisville, Pennsylvania, is more than 35 percent completed. The first battery of coke ovens and one blast furnace will be ready shortly. Full capacity of 1,800,000 tons of ingots should be attained later in the year. Another new facility, *Fairfield Works* at Fairfield, Alabama, is about 30 percent completed. Additional steel producing facilities with a capacity of 500,000 tons of ingots annually are expected to be ready for operation early in 1953.

Large deposits of aluminum phosphate, offering a possible new source of aluminum, have been discovered by the *United States Geological Survey* in the Florida land-pebble phosphate field. They occur in the Bone Valley formation of Miocene age, in a widespread zone immediately above the commercial calcium phosphate deposits, from which they were derived by processes of leaching and alteration. Over 90 percent of the calcium phosphate in the underlying phosphate rock currently mined is used to make fertilizer, whereas the aluminum phosphate has been discarded with the overburden in the process of mining. The importance of the deposits will not be known until metallurgical techniques for separating and recovering the alumina and the phosphate are fully developed and tested.

The *Mather* mine, operated by *Cleveland-Cliffs Iron Company*, is reported to have broken all existing iron ore production records on the Marquette Range during 1951. The mine yielded 1,635,256 tons, 335,175 tons better than the previous record which was established in 1950 by the same mine. The mine has a shaft in Ishpeming, Minnesota, and another in Negaunee, Michigan.

The *Haley-Young Mining Company* and *E. A. Young, Inc.* are carrying on prospecting work on the 17 prospecting permits awarded them by the State of Minnesota. Leases have been taken in some of the areas.

The *St. James* mine at Aurora, Minnesota, operated by *Oglebay, Norton & Company*, is scheduled to start shipping ore in 1952. The St. James is a former underground mine which had shipped 2,680,830 tons between 1916 and 1924, when it was a *Corrigan, McKinney Steel Company* operation.

R. T. Elstad, president of the *Oliver Iron Mining Division* of the *United States Steel Company*, reviewing the outlook for 1952, said that about 86,000,000 tons of waste material will be removed; the taconite concentration plant at Mountain Iron, Minnesota, is expected to be completed during the year and a washing plant for the Hull-Rust mine at Hibbing, Minnesota, will go into service. The lean ore from the Hull-Rust pit has formerly been shipped to Oliver's Trout Lake plant at Coleraine, Minnesota, for treatment.

Zontelli Brothers, Inc. have begun stripping a new property on the Cuyuna Range near Crosby, Minnesota. It will be known as the *Manuel* mine and includes part of the *M. A. Hanna Company's Yawkey* mine. A washing plant will be erected at the property.

The *Jones & Laughlin Steel Corporation* has dissolved its *Inter-State Iron Company* subsidiary which formerly operated its Minnesota mines. In the future, it will be known as the *Minnesota Ore Division* of Jones & Laughlin Steel Corporation. Headquarters will continue to be at Virginia, Minnesota, with Grover E. LeVeque as manager and H. F. Kullberg as general superintendent.

The *St. Joseph Lead Company* is now building a new 1,000-to-1,250-ton differential flotation mill at its Indian Creek, Missouri mine. The lead-zinc sulphide ore and dolomite gangue will be ground to 55 percent minus-200-mesh in a rod mill-classifier-ball mill circuit. The 4-mesh rod mill discharge will flow to 78-inch Wemco classifiers operating in closed circuit with Allis-Chalmers 98 rod mills. First production from the new plant is scheduled for 1952.

The *North Range Mining Company*, Negaunee, Michigan, shipped 559,548 tons of iron ore during the 1951 ore season.

The *Oliver Iron Mining Company* is building at Virginia, Minnesota, what is probably the first Diesel locomotive repair shop on the Mesabi Range. It will service all Oliver Diesel-power equipment for Oliver's Eastern District.

The *Snyder Mining Company* has finished its mining operations at the *Virginia* mine near Eveleth, Minnesota and has relinquished its lease. The mine was opened in 1910 by the *Virginia Mining Company* (*Pickands, Mather & Company*) and operated until 1914. The *Shenango Furnace Company* operated the property in 1929 and the Snyder Mining Company operated it from 1937 to date. About 3,000,000 tons have been shipped from the mine. Snyder also has a large stripping contract under way at the *Whiteside* mine, near Buhl, where an estimated 4,000,000 tons is avilable. The Whiteside was first operated in 1911, but was idle from 1915 until 1950, except for a shipment from trespass in 1927.

Zontelli Brothers Inc. are installing a new HMS plant at the *Virginia* mine on the Cuyuna Range, near Crosby, Minnesota. It will have a capacity of 140 long tons per hour and will be a No. 4M (Modified) Mobilmill with an 8 by 8 foot drum separatory vessel. It is planned to have the plant in operation for the 1952 shipping season. Zontelli Brothers have also taken over *Pacific Isle Mining Company's* lease to the *Gorman* mine at Randall, Minnesota. The mine is being dewatered in preparation for mining and stockpiling of a small amount of ore this winter.

The *Inter-State Iron Company* has completed operations at the *Grant* mine at Buhl, Minnesota, and is dismantling the equipment to be shipped to other Inter-State mines. First stripping at the Grant was done in 1906 with a clam shell that operated between two high steel towers moved on tracks. This was soon abandoned and the stripping was completed by *Butler Brothers* with standard equipment of that time. First ore was shipped in May 1936, using steam locomotives which had come from the *Hill-Annex* mine, and which were originally purchased for the *Leetonia* mine in 1912. Electric shovels were bought for the Grant in 1937, but in 1940 the railroad tracks were removed and truck-trailer haulage, the first on the range was installed. The trailers had honper dumping bottoms. Nearly 11,000,000 tons of ore have been shipped from the Grant. Inter-State is now preparing the *Wentworth* mine, seven miles east of Aurora, Minnesota, for shipping. Work is underway on a screening, crushing, and washing plant and some of the Grant mine equipment will be used for the new operation.

precipitates—SOUTHWEST

WOOD ELECTED PRESIDENT AT NEW MEXICO'S ANNUAL CONVENTION

The annual convention of the New Mexico Mining Association was held in Carlsbad, New Mexico, on January 17, 18, and 19. A record crowd of more than 400 attended the technical sessions and the guided tours through the potash mines in the Carlsbad district.

The first day of the convention was devoted to general business and to resolutions. In the evening, the annual Suppliers Party was held at the Riverside Country Club.

The most important order of business was the election of officers for 1952. In addition to the officers shown in the accompanying picture, the following new directors were elected: T. M. Cramer, United States Potash Company; F. S. Stewart, Southwestern Potash Company; and Donald Purvis, American Smelting and Refining Company.

The Resolutions Committee, with G. R. Griswold, as chairman, urged that the Selective Service group review its needs for men and weigh the loss in mineral production against the overall manpower needs of the Armed Services when considering the drafting of skilled experienced mining industry personnel.

Other resolutions urged the Defense Minerals Procurement Agency to intensify its search for critical minerals in the United States and in those countries geographically situated so we can be assured of a continuing source of supply. Stockpiling of metals and minerals essential for defense and emergency needs was recommended. It was suggested that the most efficient and economical procedure would be to stockpile when output exceeds demands, and that it is in the national interest to adjust or to suspend stockpiling purchases during a period when critical shortages of metals causes dislocation of production in defense and essential industries.

A return to "a sound fiscal policy based on the gold standard" was another resolution. In the field of taxation, an increased depletion allowance on all minerals of 25 per cent, and a revision of the depreciation policy of the Bureau of Internal Revenue were sought. The Canadian method of allowing a deduction of 30 percent on a reducing balance was recommended for depreciation.

Among the speakers at the technical sessions on the second day of the convention was Earl H. Miller, assistant resident manager, United States Potash Company, who said that "the southeastern New Mexico potash area experienced a very active year in 1951 and that exploration carried on by the Freeport Sulphur Company has resulted in the discovery of indications of a rather extensive potash bed principally in Lea County, with a small western extension in Eddy County." During 1952 additional drilling will be done in the area to determine limits of the bed and to obtain samples for metallurgical testing.

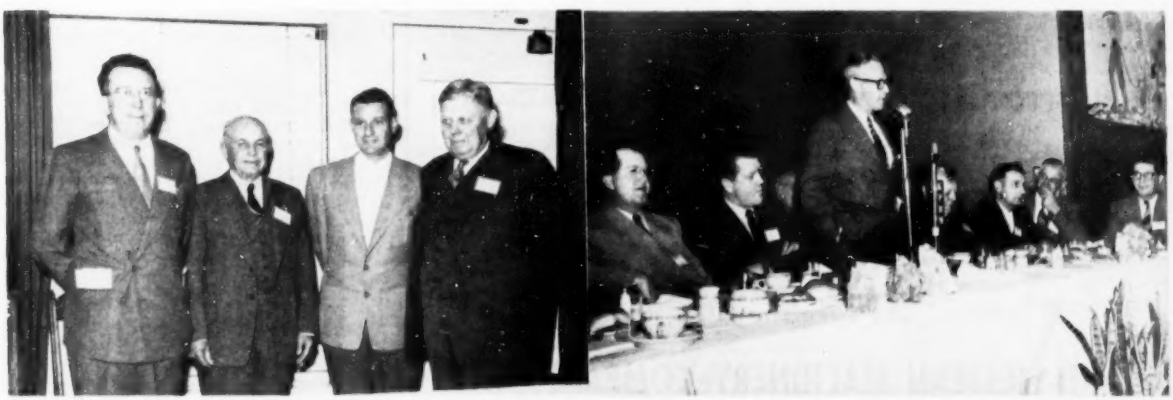
"The Carnotite Field," a review of progress in mining uranium and the work in the field by Blair Burwell, president of the Minerals Engineering Company of Grand Junction, Colorado, was reported by Ray Sullivan, vice president of the company. Other speakers included C. L. Barker, assistant manager, Denver Explosives Department, E. I. DuPont de Nemours & Company; H. H. Bruhn, Carlsbad resident manager, United States Potash Company; and Dr. Robert H. Weber, geologist, New Mexico Bureau of Mines.

Donald H. McLaughlin, president, Homestake Mining Company, was the featured speaker at the annual banquet. He said that a return to the gold standard was a means of curbing inflation and urged that the United States vigorously stockpile minerals from foreign countries. However, he urged that the government buy and pay for metals from foreign nations instead of giving away billions of dollars to those nations as is now being done.

Smelter shipments of screened lead ore are being made by C. Neil Vogel of Tombstone, Arizona, from the *Gallagher* property, owned by *Gallagher Vanadium and Rare Metals Corporation*. The property has a record of considerable silver production from the old Bradsher workings. The present operator has extended the old Stella shaft to a depth of 78 feet and is drifting both east and west from the 71-foot level. A crew of 9 men is employed on a two-shift basis.

Richard Chilson is shipping about four carloads of copper ore each week from the *Old Dick* mine in the Helvetia mining district of Pima county, Arizona. He is leasing the property from Mrs. Blankenship. The ore, which is shipped to Hayden, Arizona, is said to run about 3.5 percent copper. The Old Dick is developed by a shaft down about 100 feet.

A low-grade copper deposit on the Papago Indian Reservation, near Sells, Arizona, is being investigated by geologists of the *Anaconda Copper Mining*



LEFT: Officers of the New Mexico Mining Association are from left to right: W. Page Morris, first vice president; Ira L. Wright, second vice president; John A. Wood, president; and T. M. Cramer, retiring president. Morris is general Superintendent of the Duval Sulphur & Potash Company, Carlsbad; Wright is general manager of the Black Hawk Consolidated Mining Company, Silver City; Wood is a member of the consulting engineering firm of Chapman and Wood, Albuquerque; and Cramer is vice president of the United States Potash Company, Carlsbad. Dwight H. Packard was reelected secretary-trensurer. RIGHT: G. F. Coope, president, Potash Company of America, welcomes the more than 400 registrants to the convention. Seated at the table from left to right are: Walker Bryan, Carlsbad mayor; Edwin L. Mechem, governor of New Mexico; T. M. Cramer, retiring NMMA president; John. A. Wood, the new president; Herman Werthein: and Hollister Jones.

Company. According to R. B. Mulcahy, geologist for the firm, diamond drilling has been in progress for about a month on the 1,600 acres covered by the claims. He described the results so far as discouraging.

Western Products Company of Los Angeles is reported to have purchased the idle asbestos claims owned by the *Johns-Manville Corporation* at Chrysotile, Arizona, 30 miles east of Globe. The new owners have indicated they plan to reopen the mine. W. D. Cluff is president of Western Products Company and G. W. Johns, secretary. Both are former residents of the Safford, Arizona, area.

About five tons of manganese ore per day are being mined from open cuts at the *Bender* mine, located in the Harshaw district of Santa Cruz county, eight miles south of Patagonia, Arizona. The property is worked under lease by Rupert Beyerle and son of Nogales, Arizona. Shipments, which are expected to run 27 to 28 percent manganese, are being made to the Deming, New Mexico, ore puchase depot.

Some exploration work is being conducted at the *Country Boy* claims in the Sheridan mining district, 43 miles south of Casa Grande, Arizona. The claim is owned by William C. Davis, Casa Grande, J. A. Davis and W. W. Knapp, with the latter in charge as superintendent. Metal values are in copper and silver, with some gold. These same individuals are also developing the *Copper Ribbon* mine, a group of six unpatented claims in the same district. Some small equipment is to be purchased and a mile of road built to the property. Present plans call for initial mining by open-pit methods.

An exploration program is reportedly scheduled for the *Blue Bird* group of claims near Miami, Arizona, following their recent acquisition by W. J. Haucht, formerly of Royal Oak, Michigan. The Blue Bird group consists of 16 claims one and one-half miles west of Miami, adjacent to holding of *Inspiration Consolidated Copper Company's* properties. The claims were held for many years by the late Frank Carrow of Globe and the sales contract was signed by his brother, Jerome L. Carrow of Kingman and president of *Western Copper Company*. Previous development work consisted largely of 25 or 30 open cuts and two shafts, one 30-feet deep and the second about 60 feet, and some churn drilling. No work has been done on the property since about 1910. Lynn Hersey, consulting mining engineer of Miami, Arizona, will direct the work.

Eugene J. Meyer, Mayer, Arizona, has been granted a DMEA loan for an exploration program of diamond drilling at the *Stoddard* mine. The estimated cost of the project is $4,190, of which the government will supply one-half.

F. G. McFarland and S. R. Hullinger of Toole, Utah, are reported to have purchased the *Old Dick* mine in the Eureka mining district near Hillside, Arizona. The former owners were Michael L. Lynch, John W. Lawler, and Minnie Wells. McFarland and Hullinger have been operating the Old Dick under lease for several months. The Old Dick claim was located in 1882 and patented in 1892. No production came from the claim until 1943 when George Green and associates, operating as the *Goodwin Mining Company*, shipped 500 tons of oxidized copper ore obtained from the surface and near-surface workings. These shipments averaged 10.8 percent copper, 3.8 percent zinc, and 0.55 ounce silver per ton. In January 1948, production ran from 20 to 25 percent zinc and 2.0 percent copper, with low gold and silver content. More recently, some production has been sufficiently high in zinc to permit direct shipment to the smelter. McFarland and Hullinger also have purchased a group of claims, known as the *Combine 1*, *2*, and *3*, the *Plymouth Extension*, and the *Valencia*, from Ernest R. Dickie.

The *Arizona State Department of Minerals and Resources* has announced that the state's production of copper during 1951 reached a record high. On the basis of actual and established production figures, the annual output of copper was 842,000,000 pounds—36,000,000 pounds more than that produced in 1950, and 13,000,000 pounds more than the previous record output of 1929. Improved methods of mining, increased efficiency, and a strong market demand accounted for the rise. As a result of copper activity, gold production rose from 118,313 ounces in 1950 to 123,000 ounces in 1951; silver rose from 5,325,441 ounces in 1950 to 5,340,000 ounces in 1951. Since no mines having gold and silver as their primary mineral operated during the year, these increases can be attributed entirely to the increase in copper production. Zinc and lead output fell during the year "due to slowness of some marginal operators—producers of these metals—to get back into production following the drop in metal prices in 1950, plus a shortage of workers, and strikes." Zinc output for 1951 was 104,000,000 pounds, compared with 120,960,000 pounds in 1950. Lead production dropped from 52,766,000 pounds to 36,000,000 pounds.

Winter storms caused $75,000 damage to the *U. S. Vanadium Company's* mill at Pine Creek, California. Though the roof and walls of the lower mill section collapsed because of a heavy load of ice, operation of the mill was not affected.

The *American Potash and Chemical Corporation* recently completed its plant for the production of lithium carbonate at Trona, California, and shipments have started. The plant was rushed to completion to meet the urgent demand for refined lithium chemicals. All of the crude lithium salts recovered from the brine of Searles Lake, California are now being processed for sale as lithium carbonate.

The 39th Fair and Jumping Frog Jubilee will be held at Frogtown, Calaveras county, California, one mile south of Angels Camp, May 16, 17, and 18. The mining section includes displays of metallic and non-metallic minerals containing gold, for which the Mother Lode is famous.

The *Alta California* copper mine at Low Divide near Crescent City, California, is reportedly being rehabilitated by John Noce and associates. The old shaft has been reopened to the first or 105-foot level. Future plans call for the installation of a leaching plant to treat 20 tons of low-grade ore, and the shipment of high-grade ore to a custom smelter. The mine has been idle for 70 years.

Huntley Industrial Minerals Inc. has purchased the *Blue Star* mill east of Big Pine, California, from John Spindler. Mr. Spindler has operated the property for several years. Included in the purchase is the 200 by 100 foot steel mill building, and loading and trucking equipment. The mill will be used to process talc, in conjunction with the two non-metallic Huntley mills at Laws. The company has three large deposits at Oasis, Saline Valley, and Gabbs Valley, Nevada. The mill has a capacity of

about 2,000 tons per month and the new owners predict a sustained operation for the next 20 years.

At the Pittsburg, California plant of *United States Steel Corporation*, an additional cold reduction mill and electrolytic tinning line will be in operation shortly. The continuous sheet galvanizing line should be ready later this year.

Lippincott Lead Company is erecting a new mine-mill and smelter operation at Bonnie Clare, Nevada, 30 miles south of Goldfield. Plans call for a modern selective flotation mill process, and a smelter to reduce lead-silver flotation concentrates and lead ore into bullion. Also planned is construction of modern housing facilities. A Diesel power plant and pumping plant are now installed at the site. George Lippincott of Santa Ana, California, has operated a lead-silver property in the Panamint Mountains for the past 12 years. The new reduction plant will be about 50 miles from the mine.

Dutch Flat Mines, Inc. is developing 19 unpatented lode claims and two unpatented placer claims in Idaho Gulch in the Paradise mining district of Humboldt county, Nevada. Surface stripping is reported to have uncovered a 2,100-foot-long vein of cinnabar.

The *C and C Tungsten Mining Corporation* has been incorporated by Jay A. Carpenter, president; Hugh B. Chessher, Jr., vice president; and J. P. Hart, treasurer. The new firm will operate the *Linka* property, about 16 miles east of Austin, Nevada. Tungsten was discovered on the property in 1941 by Mr. Linka and open-pit mining was carried on during World War II. Transportation costs have been a drawback in the area and it is hoped that a concentrating mill will be erected nearby or that the government will install stockpiles for the purchase of crude ore.

Buffalo Valley mine, 18 miles south of Valmy, Nevada, recently made a 40-ton carload shipment of gold ore to a Utah smelter. The shipment is reported to have yielded $6,400. The mine was developed by the Reid Brothers of Lovelock, Nevada, and their nephew, Bob Ostrander. Mr. Ostrander is now a part owner, following the death of the Reids. Surface mining will continue.

The *Red Rock* quicksilver mine, located on the west side of Fish Lake Valley in Esmeralda county, Nevada, is planning a program of development work under terms of its new contract with the Defense Minerals Exploration Administration. Mine development to date consists of 5,000 feet of tunnel and 300 feet of shaft and winze work. Initial new development work will be surface excavation preparatory to diamond drilling on virgin ground, comprising two blocks of the property. The older workings were not included in the government-participation program. W. F. Dunnigan has been owner and operator of the mine for the past 20 years.

Dodge Brothers have joined the list of iron ore shippers from Nevada. Their mining is being done on claims owned by Heizer and Segerstrom, 30 miles east of Lovelock, Nevada. It is reported that 66,000 tons of ore have been moved from the *Modarelli* holdings in Pine Valley, under lease to J. Simplot, with 34,000 more tons to be moved under the present lease. There will be a separate lease for the removal of 130,000 additional tons of ore in the near future.

A low bid of $83,894 was made by *Pasco Steel and Construction Company* of Pomona, California on a proposed contract for construction of a new titanium pilot plant building at the electrometallurgical station of the *U.S. Bureau of Mines* in Boulder City, Nevada. Capable of producing one ton of titanium sponge per day, the new plant will be used to test new titanium production processes. Operations are expected to start by April 1.

H. W. Gould & Company, San Francisco mining engineers, are reported to have purchased a two-thirds interest in a recently discovered fluorspar deposit, *Nyco Fluorspar* mine 40 miles southeast of Warm Springs, Nevada. Development work will include construction of a mill and concentrating plant with a 75-ton daily capacity at a cost of $200,000.

Baltimore-Camas Mines, Inc. is reported to be moving its 100-ton custom mill from Hailey, Idaho to the outskirts of Ely, Nevada. A contract has been signed between city officials and the company for a 10-acre mill site and 10 acres for a tailing pond. Estimated cost of the mill is $500,000. Baltimore-Camas has tungsten claims at Cherry Creek and Spring Valley, Nevada, near Ely, and at Cherry Creek and Trout Creek in Juab county, Utah. Thirty tons per day of mill capacity will be reserved for custom concentration of ore.

A silver vein has been exposed by a drift more than 200 feet wide in the *Mohawk* mine at Argentite, Nevada. The vein is the full width of the six-foot tunnel, and 12 feet wide in a crosscut. It is said to average about 42 ounces of silver per ton and to carry some lead. Ore is being treated at the *Black Mammoth* mill, recently improved and reactivated. The *Argentite*, *Mohawk*, and *Nivloc* properties were acquired by Avery Brundage of Chicago, recently. E. R. Hines is supervisor of operations.

A 50-ton mill is reportedly to be moved from its California site to the *Lakeview* tungsten mine in Humboldt Canyon, Nevada. The mill will start operation on a 1,000-ton dump, and underground development will also begin. The property is said to consist of nine claims with a 300-foot tunnel exposing the ore. M. L. Martin of Humboldt House is the former owner. New owners are the *Lakeview Tungsten Corporation* who recently incorporated in Nevada.

At the *Noonday* mine of *Alpine Mining Company*, 55 miles southwest of Wells, Nevada, a crosscut is being driven from the main haulage level. It is expected to encounter ore in the parallel lead shoot about 80 feet to the south. With this accomplished, a station will be cut and a winze sunk to a depth of 100 feet. From this point further ore will be opened for mining by crosscutting both the lead ore shoot and the zinc ore shoot indicated along the haulage level.

NEW MEXICO

The City Council of Truth or Consequences, New Mexico has authorized Mayor T. B. Williams to sign an agreement with J. B. Knox to remove manganese from the west ends of two downtown streets of the town.

The *United States Atomic Energy Commission* has signed a contract with the *Anaconda Copper Mining Company* under which the AEC will purchase the uranium production of an ore processing plant which Anaconda will build near Grants, New Mexico. Construction has started and the plant is expected to be in operation early in 1953. Arrangements are being made to provide a market at the plant site for uranium-bearing ores produced by other operators in the area, including the *Blue Peak Mining Company*, F. A. Sitton of Dove Creek and Grand Junction, Colorado, and the *Malpai Mining and Holding Company*. Many of these groups have been shipping to the depot at Monticello, Utah. The AEC has also established a purchasing station for uranium-bearing ores on the Navajo Indian Reservation at Shiprock, New Mexico. This depot is being operated for the AEC by the *American Smelting and Refining Company* which also operates ore purchasing stations at Monticello and Marysvale, Utah.

Clark and Mathis have received DMEA approval for a $10,274 lead and zinc project in Luna county, New Mexico, with the government putting up $5,137 of the cost. Col. C. F. Williams and Charles Bradbury, co-owners of the historic *San Pedro* mine, have received an $83,700 DMEA loan to explore for copper. The year-long project will be at the mine site in the Santa Fe Mountains, some 40 miles northeast of Albuquerque, New Mexico.

The *Imperial Sulphur and Acid Company* will begin building a $50,000 plant this spring at Fruitland, New Mexico to recover sulphur from natural gas. Production is expected to start about July 1. A pilot plant there is reported to be recovering sulphur at the rate of 200 pounds daily. The main plant at full capacity would produce 75 tons daily.

The *Peru Mining Company* is installing a fifth grinding circuit at its Deming, New Mexico differential zinc-lead flotation mill. The new 66 Marcy ball mill and Wemco 60-inch classifier will raise daily mill capacity 250 tons to a total of 1,250. The mill treats custom ore from *Kennecott Copper Corporation* and others, as well as Peru ore from the *Pewabic* and *Kearney* mines. Joseph H. Taylor, Deming, is company vice president in charge of New Mexico operations.

The *Duval Sulphur & Potash Company* is in production. The new Carlsbad, New Mexico firm shipped two carloads of potash early in December and is readying more for shipment. Both shafts have been completed and drifting has begun. The refinery is in operation. The full-production goal is in April, after a gradual buildup. The $7,500,000 mine and refinery will employ 400 men. Officials include Page Morris, general superintendent; J. E. Tong, mine superintendent; G. E. Atwood, refinery superintendent; L. V. Nelson, master mechanic and chief electrician; B. G. Messer, mine engineer; J. W. Borskey, chief chemist; John Gasparich, mine general foreman; and I. B. Phillips, refinery general foreman.

precipitates—NORTHWEST

Tungsten Firm Gets First DMEA Production Loan

First mine production loan in the Pacific northwest under the defense program was granted recently to Tungsten Mining and Milling Company of Spokane, Washington. The Spokane loan agency of the Reconstruction Finance Corporation announced it would loan the firm $50,000 for the purchase of additional mill machinery for the Germania mine near Fruitland in Stevens county, Washington.

The loan was recommended by a DMEA field team working out of Spokane. It was in addition to a $25,987 DMEA exploration loan granted the company last October.

Paul H. Casey, Spokane, is president and general manager of the tungsten company. In 1951 it rehabilitated an old mill building at the property, originally developed by German interests, and installed gravity concentration machinery. A test run showed need of flotation cells and a rod grinding mill. There is reported to be an estimated 30,000 tons of tungsten ore in old workings, plus 120,000 tons of $9-a-ton mill tailings and 200,000 tons of commercial surface talus material.

Stockholders of *Vindicator Silver-Lead Mining Company* have given conditional approval to a plan of *Silver Mountain Lead Mines, Inc.*, to consolidate the three-claim *Vindicator* property with several adjacent properties and enter into a development contract with *Sullivan Mining Company*. The merger was approved on condition that Vindicator receive 550,000 shares of stock in the 5,000,000-share Silver Mountain firm, which reportedly plans to give 3,000,000 shares for properties. *Idaho Silver Corporation* of Wallace, Idaho is expected to be the next company to vote on the proposed merger. The properties are in the Hunter mining district of the Coeur d'Alenes, east of Mullan, Idaho.

Coeur d'Alene Mines Corporation, Mullan, Idaho recently started stoping ore from the "wire silver" vein in the adjoining *American Silver Mining Company* property which it is developing on a 50-50 profit splitting basis. The stope is going up from the 2,800 level. Three diamond drill holes have disclosed silver-copper ore below this level and preparations are being made to sink a winze on the vein.

Sunshine Mining Company, the nation's leading silver producer, has entered into an operating agreement in connection with another neighboring property in the Big Creek area east of Kellogg, Idaho. It is the 39-claim *Lucky Boy* group owned by *Coeur d'Alene Silver Giant Corporation*, of which Harry G. Alway, Osborn, Idaho, is president. The claims are south of *Metropolitan Mines Corporation's* holdings now being explored at a depth of 3,100 feet by a long southerly crosscut from Sunshine's Jewell shaft. The crosscut has been driven more than 6,000 feet. The Sunshine-Coeur d'Alene Silver Giant operating agreement calls for a 50-50 division of profits.

Federal Mining and Smelting Company will explore the old *Hickory* mining claim adjoining its *You Like* claim near Mullan, Idaho. Crews are rehabilitating an old drift on the 600 level of Federal's *Morning* mine preparatory to extending it along the You Like vein system into Hickory ground. The Hickory claim, located in 1884, has yielded a little silver-lead-zinc ore from shallow workings. It is owned by James W. Roberts of California, and held under lease by *Hickory Leasing Company*, a partnership consisting of S. K. Garrett and Joseph L. Fisher, both of Osburn, Idaho, and Bryan J. Dickinson of Kellogg.

Sidney Mining Company is planning to explore an area north of its present mining operation in the Pine creek district of the Coeur d'Alenes, according to W. T. Simons of Kellogg, Idaho, president. Ore developed so far on the No. 11 level has been below expectations in both quantity and quality. Sinking is continuing to open a new No. 13 level next spring.

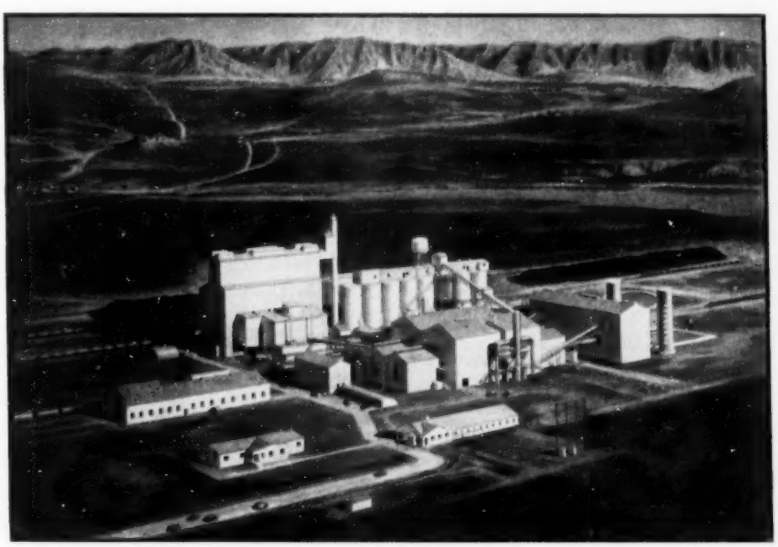
Whitedelf Mining and Development Company of Clark Fork, Idaho, has let a contract for the first part of a 400-foot shaft deepening project under a $126,000 DMEA lead-zinc exploration contract, according to Compton I. White, managing director.

Silver Banner Mining Company, following surface bulldozing and trenching of its 54-claim property west of Mullan, Idaho, is diamond drilling to test Moe vein structures below creek level. Manager S. K. Garrett reported. *Continental Drilling Company* of Los Angeles has the contract.

Donald D. Hanni, Custer county mining man, has announced plans to explore two groups of mineral claims with the aid of a $17,000 loan granted recently by the Defense Minerals Exploration Administration. They are the *George Washington* group on Alder creek and the *Silver Bell* property on Cliff creek, both in Custer county. Surface bulldozing and tunnel clearing will precede underground work.

Louis Truger, designer and builder of a uranium concentrator at the *Thornton* mine near Garden Valley, Idaho, reported test runs satisfactory and said steady operation of the mill is planned.

Stockholders of *Sun Valley Lead-Silver Mines, Inc.*, Ketchum, Idaho, recently boosted their capital stock from 3,000,000 to 4,000,000 nonassessable shares and authorized a 500,000-share



VICTOR CHEMICAL OPENS NEW PLANT

The new $5,000,000 elemental phosphorus plant of Victor Chemical Works at Silver Bow near Butte, Montana, where production has started. Phosphate rock is supplied by the company's two mines—the Maiden Rock and the Canyon Creek, located on opposite sides of the Big Hole River about 40 miles south of Butte. Combined output of these mines is planned at 600 tons per day. With this expansion, the company is now one of the world's largest producers of phosphorus and phosphate products.

public offering. Funds would be used to match a $28,340 government exploration loan and to purchase additional mining machinery for development of the *Blue Kitten* mine and five other properties held under lease and option in Blaine county.

Sunrise Mining Company of Seattle has been reopening its main working tunnel adjoining *Bunker Hill & Sullivan's Crescent* holdings on Big Creek east of Kellogg, Idaho. William Zanetti is in charge. A. M. Hoffstater of Seattle is president of the firm.

A $5,000,000 electric furnace is being built by *Monsanto Chemical Company* to produce elemental phosphorous, two miles north of Soda Springs, Idaho. Production is expected to start during the summer of 1952. Strip mining began last summer and a stockpile of 250,000 tons will be moved to the plant site beginning in June. J. E. Gurvin is superintendent of the facility, and will be plant manager on completion.

A promising quartz-copper vein is reported to have been opened up in the *Petsite* group, located in the Orogrande district, Idaho county, Idaho. A strike is said to have been made while extending an old tunnel driven more than 30 years ago. Within five feet, a quartz vein about six-feet wide was encountered with showings of copper. Ross Brattain is owner and director.

Lead Zone mine, owned and operated by *Lead Zone Mining Company, Inc.* of Boise, Idaho, is now on a producing basis, according to Harold H. Drederikson, secretary. The property is located on the flat top of Cuddy Mountain, northwest of Weiser, Idaho. The district has long been known as having promising ore bodies but prohibitive transportation costs have prevented operations. The property is located on the Galena Mountain structure and mineralized zones have been traced vertically for thousands of feet. Construction of Hell's Canyon Dam will cut 3,000 feet off the available depth on the Snake River side. Returns on shipments already made are reported to have averaged more than $80 per ton.

Fred Baumhoff, Centerville dredge operator, announced at Boise, Idaho, plans for a $1,000,000 dredge to excavate monazite sand near Cascade, Idaho. He operated one dredge at Cascade during the past year. Production is going to *Lindsay Light and Chemical Company* of West Chicago, Illinois. Charles R. Lindsay III, company president, is reported to have said that the Cascade monazite deposits exceed those in Brazil and India.

MONTANA

The *Iron Cross* property in Broadwater county, Montana, has the best titanium deposit found so far in the Pacific Northwest, according to the U. S. Bureau of Mines' Northwest mining division with headquarters at Spokane, Washington. Preliminary sampling indicated about 9.0 percent titanium dioxide. An estimated 4,500,000-ton deposit of titaniferous magnetite in Teton county, Montana, averages about 6.0 percent titanium dioxide. A similar deposit in Pondera county

METAL AND MINERAL MARKETS

METALS

February, 20, 1952

COPPER:	**Electrolytic.** Delivered F.o.b. cars, destination U.S.A.	24.50¢
	Lake. Delivered, destinations U.S.A.	24.625¢
	Foreign Copper. New York	27.50¢
LEAD:	**Common Grade.** New York	19.00¢
	Foreign lead. New York delivery. (Import price ceiling)	19.00¢
ZINC:	**Prime Western.** East St. Louis	19.50¢
	Foreign zinc. East St. Louis delivery. (Import price ceiling)	19.50¢
ALUMINUM:	**Primary 30 pound Ingots (99% plus).** F.o.b. shipping points	19.00¢
ANTIMONY:	**Bradley Mining Co.'s Elk Brand 99.5%.** F.o.b. Cascade, Idaho	50.00¢
	Lone Star Brand. F.o.b. Laredo, in bulk	50.50¢
BISMUTH:	(In ton lots) price per pound	$2.25
CADMIUM:	**Sticks and bars.** 1 to 5 ton lots (Price per pound)	$2.55
COBALT:	**97-99%,** keg of 550 pounds (Price per pound)	$2.40
MAGNESIUM:	**Ingots (99.8%).** F.o.b. Freeport, Texas	24.50¢
MERCURY:	**Flasks.** Large lots, New York	$203.00-$207.00
NICKEL:	**"F" Ingots (5 pounds).** F.o.b. refinery, Port Colburne, Ontario	56.50¢
TIN:	**Grade A Brands.** New York (Price per pound)	121.50¢
TITANIUM:	**(98.5%).** F.o.b. Beverly, Massachusetts	$7.00
GOLD:	United States Treasury price	$35.00 per ounce
SILVER:	**Newly mined domestic.** United States Treasury price	90½¢ per ounce
	Foreign. Handy & Harman	88.00¢ per ounce
PLATINUM:		$90.00-$93.00 per ounce

ORES AND CONCENTRATES

BERYLLIUM ORE:	**10 to 12% BeO. F.o.b. mine, Colorado**	**$35.00 per unit**
CHROME ORE:	**F.o.b. railroad cars eastern seaports. Long tons dry weight.**	
	African (Rhodesian). 48% Cr_2O_3.	
	3 to 1 chrome-iron ratio	$43.00-$44.00
	African (Transvaal). 48% Cr_2O_3.	$34.00-$35.00
	Turkish. 48% Cr_2O_3. 3 to 1 chrome-iron ratio	$52.00-$53.00
	U. S. Government ore purchase depot Grants Pass, Oregon, Base price, lumpy ore, $115.00; fines and concentrates $110.00 for 48% Cr_2O_3 and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr_2O_3 and a 2 to 1 ratio.	
IRON ORE:	**Lake Superior. Per gross ton Lower Lake Ports.**	
	Mesabi, Non Bessemer, 51.5% Fe	$ 8.30
	Mesabi, Bessemer, 51.5% Fe	$ 8.45
	Old Range, Non Bessemer	$ 8.55
	Old Range, Bessemer	$ 8.70
MANGANESE ORE:	**Metallurgical grade. 46 to 48% Mn. Long ton unit**	**$1.10 to $1.18**
	Chemical grade. 80% MnO_2. Per ton	$60.00
	Chemical grade, domestic, 70% MnO_2, F.o.b. mines	$45.00
	U. S. Government ore purchase depot Deming, New Mexico. Base price, $6.10 per long dry ton for 15% ore. Price increasing to $76.00 for 40% ore. Less $12.00 per long dry ton for milling. U. S. Government purchase depot Butte, Montana. Base price, $6.05 per long dry ton for 12% ore. Increasing to $40.42 for 30% ore. U. S. Government purchase depot Phillipsburg, Montana. Base price, $6.43 per long dry ton for 15% ore. Increasing to $34.81 for 30% ore. (Montana ore must contain not less than 90% as carbonate).	
MOLYBDENUM CONCENTRATE:	**90% MoS_2. F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers**	**$1.00**
TUNGSTEN CONCENTRATE:	**60% WO_3. Per short ton unit**	$65.00
URANIUM ORE:	**Carnotite-Roscoelite. F.o.b. purchase depot plus $0.06 per ton mile (maximum of $6.00), Rifle, Naturita, Uravan and Durango, Colorado; Salt Lake City and Monticello, Utah. Base price for 0.10% ore is $1.50 per pound and ranges to $3.50 per pound of contained U_3O_8 plus $0.75 per pound for each pound in excess of four pounds per short dry ton and an extra allowance of $0.25 per pound for each pound in excess of 10 pounds. A development allowance of $0.50 per pound is paid for all ores purchased.**	
VANADIUM ORE:	**Carnotite-Roscoelite. V_2O_5 content, up to 10 pounds, in uranium ore paid for at $0.31 per pound in ratio of 10 parts V_2O_5 to 1 part U_3O_8.**	

NON-METALLIC MINERALS

BENTONITE:	**Minus-200-mesh. F.o.b. Wyoming points. Per ton in carload lots**	$12.50
	Oil Well grade. Packed in 100 pound paper bags	$14.00
FLUORSPAR:	**Metallurgical grade. 70% effective CaF_2 content per short ton F.o.b. Illinois-Kentucky mines**	$43.00
	Ceramic grade. Minimum CaF_2 content, 95%	$45.00
	Acid grade. 97% CaF_2	$60.00
PERLITE:	**Crude: F.o.b. mine per short ton**	**$3.00 to $5.00**
	Plaster grades. Crushed and sized. F.o.b. plants per short ton	**$7.00 to $9.00**
	Concrete grades. Crushed and sized	**$6.00 to $8.00**
	Oil Well Grades.	**$6.00 to $9.00**
SULPHUR:	**Long ton, F.o.b. Gulf Coast mines**	**$22.00**

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averages 5.0 to 8.0 percent titanium dioxide.

Amador Mining Company plans to unwater old workings at its long-idle property on Cedar Creek, south of Superior, Montana, under a $72,190 copper exploration project approved by the DMEA. The firm is headed by Merrill H. Christman of Missoula.

Production has been resumed at the old *Iron Mountain* mine near Superior, Montana, after completion of a compressor building and installation of necessary equipment. The tunnel was rehabilitated and rail and pipe were installed for a distance of 6,000 feet. Ernie Smith, who formerly operated the nearby *Nancy Lee* mine under lease, is planning to ship Iron Mountain ore to the Nancy Lee mill on a custom basis for the present time.

PRODUCTS AND SUPPLIES:

DRILLING COMPANIES:

The *United States Atomic Energy Commission* has set up a suboffice in Butte, Montana under the supervision of the newly created Salt Lake office of the AEC's Raw Materials Division. M. L. Reyner, geologist, formerly with the Spokane office, will be in charge of the Butte suboffice.

Recently incorporated in Montana were the *Jack Group Mining Company* of Dillon with authorized capital of $50,000 by V. L. Pitts, William Tibbles, and Paul Betz; *Ironhead Mining Corporation* with a capital of $50,000; and *Placer Mines, Inc.* of Great Falls with a capitalization of $50,000. Directors of Ironhead are Dorothy and Otto J. Pawlitscheck and Sterling Douglas; Clyde W. Eggers, Richard D. Strobel, Elmer E. Anderson, and Lois M. Eggers are directors of Placer Mines.

WASHINGTON

Spokane-Idaho Mining Company has diamond drilled a promising zinc-lead ore body below the adit level of the old *Cleveland* mine in southwestern Stevens county, Washington, according to President Frank N. Marr. One hole reportedly was in ore for 66 feet. A second hole showed a 25 to 30-foot ore width. The cores showed no antimony, such as caused treatment complications in ore mined from shallow workings in early days. Spokane-Idaho leased the Cleveland in September.

Full-scale production at the government-owned Mead magnesium plant near Spokane, Washington is scheduled to start when spring thaws make additional hydroelectric power available. The $20,000,000 World War II plant, rehabilitated during the last nine months at a cost of $2,500,000, started producing magnesium again last August and has been operating at 50 percent capacity since October. All except four of the plant's 432 vacuum furnaces were idle for about seven years. *Pacific Northwest Alloys Company*, which is turning out magnesium for the government, started producing ferroalloys at the plant in 1948 and eventually utilized four of the furnaces. A subsidiary of *Chromium Mining and Smelting Corportion* of New York, it is using the four furnaces now to produce ferrosilicon, which is used in extracting magnesium from dolomite mined at a $1,000,000 government quarry at Marble, Washington. The plant originally was designed to produce 4,000,000 pounds of magnesium yearly. Current production is a government secret. About 750 production workers are currently employed.

First large-scale mining of iron ore from the Pacific Northwest is scheduled to get underway soon as weather permits, according to G. R. Shallenberger, Northwest representative for *Three Peaks Mining Company* of Salt Lake City. He said the company has so far contracted to purchase more than 500,000 tons of iron ore from Stevens county, Washington properties for shipment to Japan. Dumps at the old *Electric Point* lead mine near Leadpoint, Washington, are expected to yield 200,000 tons of ore with a limonite-hematite content of more than 50 percent, he said. The company plans to "glory-hole" an estimated 250,000 tons of 55 to 60 percent hematite ore from the Kulzer property near Valley, Washington. The firm also hopes to mine at least 500 tons daily from the Kulzer and an equal amount from the Electric Point.

Kennecott Copper Corporation has opened a Northwest exploration office in Spokane, Washington through a subsidiary, *Bear Creek Mining Company*. L. B. Moon, former chief of the Bureau of Mines' minerals division at Washington, D.C., is in charge.

Pend Oreille Mines and Metals Company's Josephine mill, closed last summer by labor shortage, has been reopened, according to general manager W. L. Zeigler of Metaline Falls, Washington. It is operating at 650 tons daily capacity. The first unit of the company's new mill is operating at 800-ton daily capacity. The second 800-ton unit is scheduled to go into operation by mid-April. A third 800-ton unit will be completed when labor and materials permit, Zeigler said.

Grandview Mines and Metaline Mining and Leasing Company have taken leases and options on the 10-claim *Hidden Treasure* group and the 19-claim *Baily-Hanson-Johnson* group in the Slate Creek section of the Metaline mining district, Washington. Karl W. Jasper of Spokane, who heads both firms, said exploration work will start by May 1. It is the first joint venture for the two firms whose own mining properties are being operated by *American Zinc, Lead and Smelting Company* and *Sullivan Mining Company*, respectively. Their new holdings are adjacent to the *Lead Hill* property recently placed in production by American Zinc.

The Defense Minerals Exploration Administration approved 66 Pacific Northwest mineral exploration projects in 1951 costing an estimated $3,268,390. This is the report of A. E. Weissenborn, executive officer in charge of the agency's Spokane field office. Twenty-six projects were approved in Idaho, 25 in Montana, 13 in Washington and 2 in Oregon. Thirty-seven of the contracts were for lead-zinc exploration, 10 for tungsten, 7 for copper, 5 for antimony, 2 for manganese, 2 for uranium, and 1 each for monazite, fluorine, and thorium. The government agreed to pay $1,831,657 of the total exploration costs.

The *West Coast Mineral Association* has adopted a resolution calling for the free trading of gold for all purposes, other than monetary, by any one within the United States and its possessions. Harry Townsend, president, is cooperating with mining associations, members of Congress, and others for the enactment of the resolution into law.

Exploration and development of *Talisman Mining and Leasing Company's* Laurier, Washington mine have been taken over by Frank Eichelberger and Associates of Spokane, according to an announcement by Henry T. Bron, of Hayden Lake, Idaho, who is president of Talisman. Talisman received one of the first DMA exploration loans granted in Washington. The mine has yielded gold and copper. Tungsten, cadmium, silver, and zinc are also believed to be recoverable. E. E. Eddy will be resident engineer for Eichelberger. A 3,000-foot aerial tramway at the property has been reconditioned.

Grants Pass Chrome

Continued from page 48

the few months of the purchasing depot's operation will be very evident. Some miners were ready to ship on a good scale when snow shut them down.

Concentrators Constructed

One feature which may assume special importance is the construction of concentrating mills to supply chrome concentrates to the depot. If production from these mills lives up to the owners' expectations, the life of the program may be shortened.

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THE MARKET PLACE

THE MARKET PLACE

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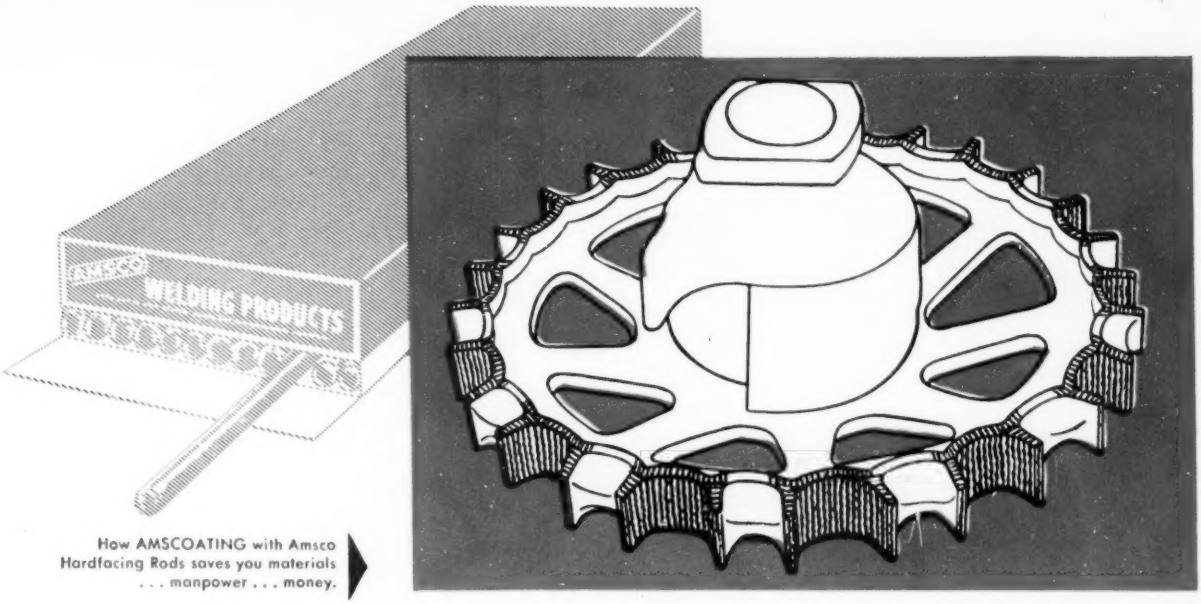

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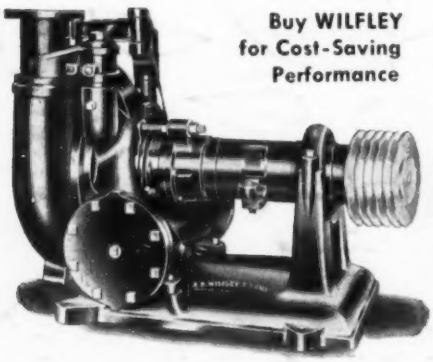

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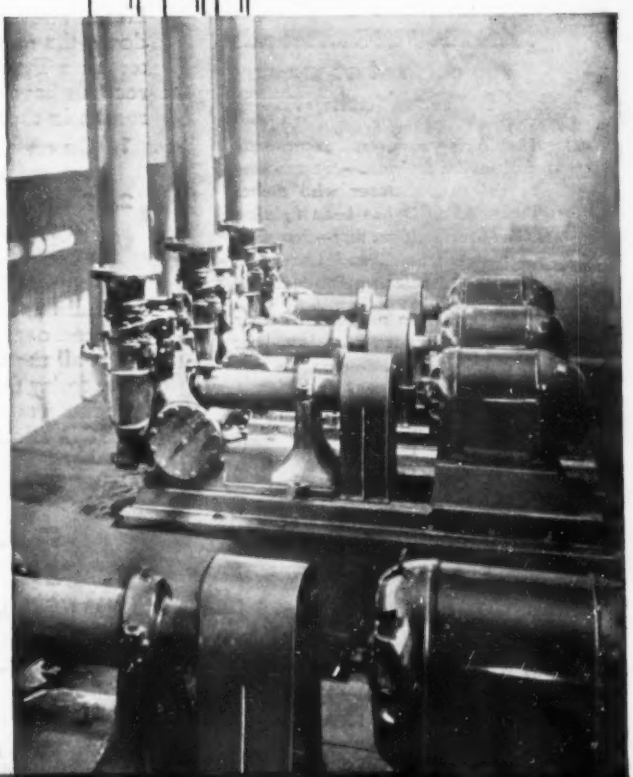

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